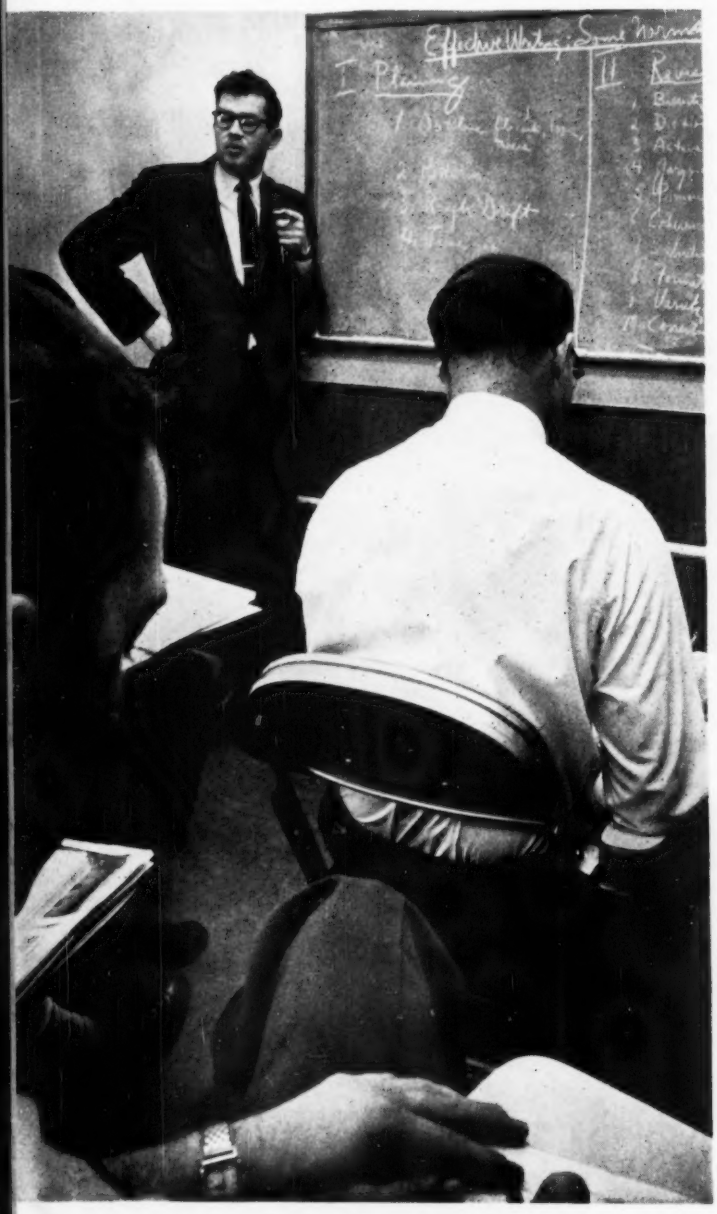
A McGRAW-HILL PUBLICATION

# Chemical Week



APRIL 2, 1960 Price 50 cents

Acetylene: How planned Gulf Coast complex breaks tradition . p. 13

Exporters mobilize to boost return from waning markets . . . p. 27

***Researchers polish their prose . . p. 35***

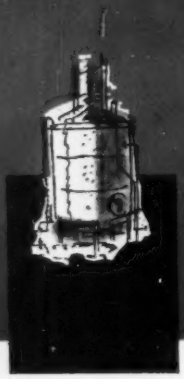
Navy's nitroglycerine processing: now four ways safer . . . . p. 55

Electricity from heat—direct route nears commercial payoff . . p. 70

STEVENS RICE
UNIVERSITY MICROFILMS
513 N 1ST ST
ANN ARBOR MICH

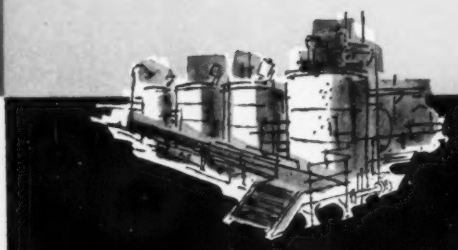
# TRULAND . . . *Expands Its Facilities*

- *High Vacuum Processing*
- *High Pressure Processing*
- *By-Product Refining*



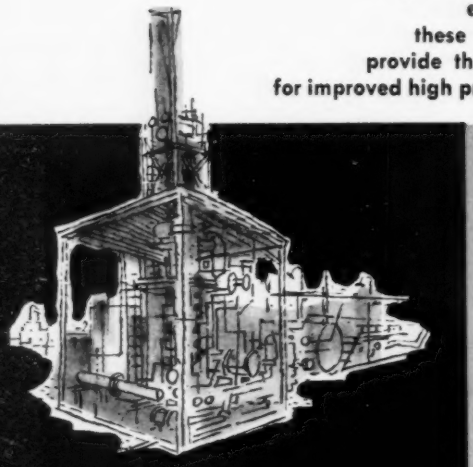
***NOW . . .***

*Stainless Steel Reactor for Processing*



**Autoclave Reaction Facilities**

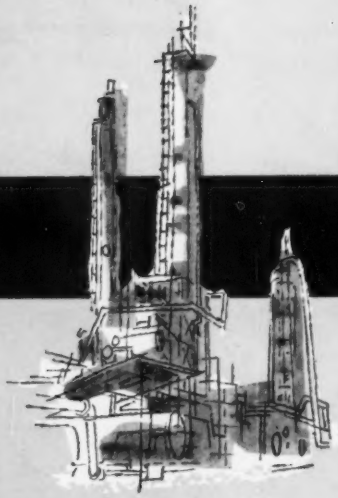
Available for all high pressure operations including hydrogenations, ethoxylations and reductions, these facilities and appurtenances provide the answer to industry's need for improved high pressure processing equipment.



**Rodney Hunt Stainless Steel TURBA-FILM Processor**

Available for obtaining vacua as low as 0.5MM Hg Absolute, Truland's new high vacuum processor is particularly suitable for time-at-temperature-sensitive materials and viscous liquids. Requires just one continuous and swift pass.

**Fractionating Facilities**



The facilities and experience of Truland may be employed advantageously for the economical upgrading and disposal of solvent mixtures and organic by-products. Our technically trained personnel will gladly discuss your specific requirements and a cordial invitation is extended for you to inspect our new facilities.

*Send* for illustrated booklet which describes our operation

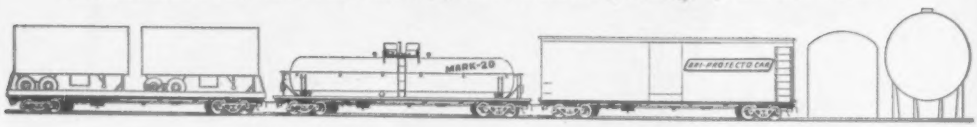
TRULAND

TRULAND CHEMICAL COMPANY Division of THE TRUBEK LABORATORIES

East Rutherford, New Jersey

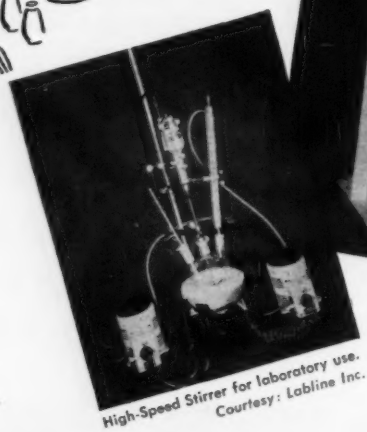
# Is your capital wide-awake?

Sleepy money tied up—unnecessarily—in railroad cars can't be much help to an aggressive company. ▶▶▶By *leasing* from North American Car, successful marketers of everything from fertilizer to frankfurters keep their capital wide-awake... free to develop new products, new markets, new plants. ▶▶▶If rail shipping plays a part in your marketing logistics, why not investigate the special advantages of leasing from North American Car? Here your transport problems get close, personal attention from experts who understand your business. Here you can get any car you need, *custom tailored* to your specifications. You eliminate maintenance expense, keep costs predictable. Your capital stays wide-awake for use in your own business. ▶▶▶ Tell us what you ship... we'll tell you how we can help you. Write or phone **NORTH AMERICAN CAR CORPORATION,** 231 S. LaSalle St., Chicago 4, FInancial 6-0400.

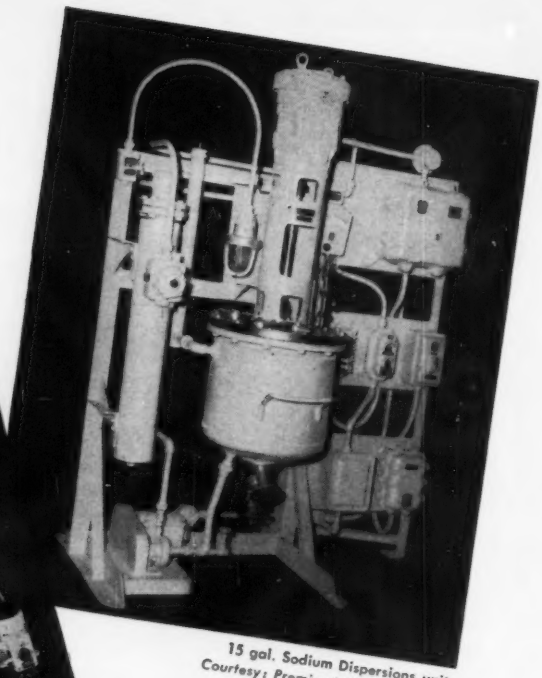



*Piggyback and Containerization cars and services • Tank cars, up to 20,000 gallon MARK-20 car • Dri-Protecto, refrigerator, covered hopper and livestock cars • Sag Junction Terminal storage on Illinois Waterway*

IF IT'S NEW IT'S **NORTH AMERICAN**



High-Speed Stirrer for laboratory use.
Courtesy: Labline Inc.



15 gal. Sodium Dispersions unit.
Courtesy: Premier Mill Corporation.

# "do it yourself" sodium dispersions?

***Why not? With the modern equipment available, you can make your own dispersions and enjoy several outstanding advantages:***

1. You can make any quantity you desire.
2. You have closer control on adjusting particle size to your specific needs.
3. You reduce the tendency of dispersions to settle out, oxidize or agglomerate.
4. You make only the dispersions you want *when* you want them.

We'll be glad to send you all the facts on modern dispersion equipment and our booklet—USING "ETHYL" SODIUM IN DISPERSED FORM—which describes the preparation of dispersions for laboratory, plant or commercial use.

For your copy, simply mail coupon below.

**ETHYL CORPORATION,** NEW YORK 17, N.Y. • TULSA • CHICAGO • LOS ANGELES

**ETHYL CORPORATION OF CANADA LIMITED,** TORONTO • **ETHYL USA (EXPORT)** NEW YORK 17, N.Y.

ETHYL
SODIUM METALLIC
ETHYL CORPORATION

**ETHYL CORPORATION**
**100 Park Avenue, New York 17, N.Y.**

☐ Please send more information on Dispersions Equipment

☐ Please have Engineer call

NAME_____

FIRM_____ TITLE_____

ADDRESS_____

CITY_____ STATE_____

CW 4-2-60

Chemical Week

**TOP OF THE WEEK** **April 2, 1960**


**Petrochemical makers' sales spurt 20-25% in '59**—prelude to bigger gains in '60? ..... **p. 14**

**Drugmakers' dilemma—push for more outlets,** or stick with pharmacies? New court decisions underscore the problem . **p. 40**

**Fertilizer production outlook good, particularly for ammonia.** But now bad weather stalls sales ..... **p. 47**

**Acrylic latex field expands** as B. F. Goodrich gears for production of new textile-finishing formulation ..... **p. 67**

**5 VIEWPOINT**
Here's common-sense talk on aid we must give South America to participate in its markets.

**5 LETTERS**

**5 MEETINGS**

**9 BUSINESS NEWSLETTER**

**13** Acetylene-from-natural gas: proposed project aims to shave financing costs, apply savings to trim product price.

**14** How oil companies shared in last year's boom; sales of petrochemical affiliates rose 20-25%.

**15** Chemical companies find a friend—USDA research chief helps in Congressional "cancer clause" battle.

**15** Maleic hydrazide is under fire again. Maker suggests problem is caused by farmers' misuse.

**23 WASHINGTON NEWSLETTER**

**27 SALES AND DISTRIBUTION**
CPI exporters, impatient for government help, plan private drive to recapture foreign markets.

**33** Industry executives join railroads in battle over barge-line ownership.

**35 RESEARCH**
Courses to make better writers of researchers pay off in clearer, more effective reports.

**40 ADMINISTRATION**
State court rulings permitting supermarkets to sell proprietary items pose problem to drugmakers.

**45** Teamsters lose in bid to take over as union at Virginia-Carolina's phosphate works.

**49 MARKETS**
Weather retards fertilizer sales, but makers still expect big year. Ammonia will gain most.

**55 PRODUCTION**
Safety is key feature of new, automatic nitroglycerine transfer system at naval propellant plant.

**61 TECHNOLOGY NEWSLETTER**

**67 SPECIALTIES**
B. F. Goodrich sets sights on acrylic latex market, will offer textile finishers new latex base.

**75 MARKET NEWSLETTER**

**79 ENGINEERING**
Direct conversion of heat into electric power enters home stretch in drive for commercialization.

**81** Monsanto engineers tell how to use timesaving photo-drafting techniques in plant design.

**84 BUSINESS BENCHMARKS**

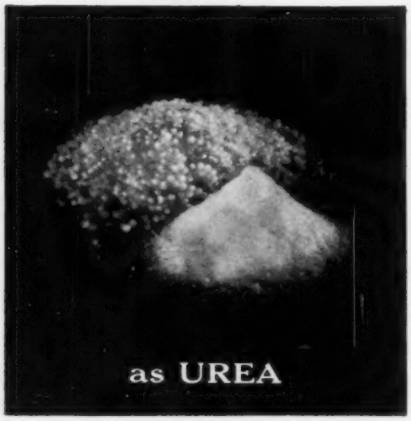

**Vol. 86**
**No. 14**

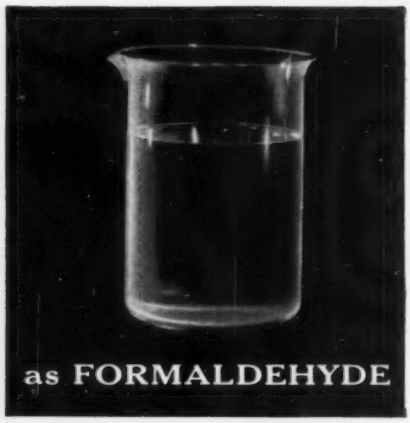
Chemical Week is published weekly and copyrighted © 1960 by McGraw-Hill Publishing Co., Inc. 330 W. 42nd St., New York 36, N. Y. Place of publication: 3rd and Hunting Park Ave., Philadelphia 40, Pa. Second-class postage paid at Philadelphia. Subscription: $3/year in U.S.A. Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week. Please see page 7 for subscription requirements.

**Postmaster: Please send Form 3579 to Chemical Week, 330 West 42nd St., New York 36, N. Y.**

BUY UREA AND FORMALDEHYDE WHICHEVER WAY YOU WANT...

# separately




# or together

Allied Chemical makes it possible for you to buy urea and formaldehyde in whichever form is most convenient for *you*. Separately:

**UREA** — high-purity crystal and uncoated pelleted, available from *two* producing plants — in South Point, Ohio and S. Omaha, Nebraska.

**FORMALDEHYDE** — Allied Chemical offers you a full range of concentrations from 37% to 50%.

Or together:

**U. F. CONCENTRATE 85** — An easy-to-handle, easy-to-store combination of 60% formaldehyde and 25% urea. Permits larger batches per kettle, shorter cycles, more production from existing equipment.

Write for technical data, prices, delivery information.

*For specifications and local offices, see our insert in Chemical Materials Catalog, pages 475-482 and in Chemical Week Buyers Guide, pages 37-44.*

BASIC TO AMERICA'S PROGRESS

Allied Chemical

**NITROGEN DIVISION**
Dept. UF 5-7-3, 40 Rector Street, New York 6, N. Y.
(HAnover 2-7300)

2819

# LETTERS

## Charting Petrochemicals

TO THE EDITOR: You published a very interesting chart (*July 31, '54*) relating the approximate values of petroleum and petrochemical products in a two-dimensional field.

I have not seen a more recent chart of this type, and therefore I wonder whether I have somehow missed such an item. If not, will your readers have the pleasure of receiving an updated version sometime in '60? It seems like an appropriate way to start the interesting decade of the '60s.

The subject has undoubtedly grown more complex since '54, so that other ways of publishing the material contained in the chart might be even more interesting. Of course, it would be best to have several methods of presenting the information, embracing both schematic charts and convenient tables.

W. R. GUYER
Esso Research Ltd.
London, Eng.

*It's true that today's chart would be more complex, but the products listed in '54 would still stand in the same cost relationship. A more recent chart appears in a report in* Chemical Engineering, *May 18, '59, pp. 151-168. Reprints are available for $1. Address: 330 West 42nd St., New York 36, N.Y.*—ED.

# MEETINGS

**Nuclear Congress**, Coliseum, New York, April 3-8.

**American Oil Chemists Society,** Baker Hotel, Dallas, Tex., April 4-6.

**Instrument Society of America,** national chemical and petroleum instrumentation symposium, Sheraton Hotel, Rochester, N.Y., April 4-6.

**American Chemical Society,** national meeting, Cleveland, April 5-14.

**Lead Industries Assn.,** 32nd annual meeting, Chase-Park Plaza Hotel, St. Louis, Mo., April 6-7.

**National Industrial Conference Board;** conference theme: "Atomic Energy in Industry," Waldorf Astoria Hotel, New York, April 6-8.

**Society of the Plastics Industry,** Western Section Conference, New Riviera Hotel, Palm Springs, Calif., April 7-8.

# VIEWPOINT

## Common Sense on Latin America

RECENTLY SIGNED TREATIES will create two regionally integrated trading blocs in Uncle Sam's front yard—one creating a seven-nation Latin-American free-trade zone; the other, a tripartite (Guatemala, El Salvador, Honduras) Central American customs union and "common market." They pose two significant questions to U.S. businessmen: (1) What effect will the treaties have on U.S. trade? and (2) What should we do about them?

At stake is a Latin-American chemical market of some $4.5 billion/-year by '65, that, because of a relatively slow-growing Latin-American chemical industry, will need $1 billion/year worth of imported chemicals to help meet local needs.

The move toward Latin-American economic integration was inevitable. Although growing rapidly, Latin markets are small and scattered, unable to support large-scale, economical plants of a size competitive with those of the U.S. and Europe.

While many favor integration as a necessary first step, it is generally recognized that the treaties themselves contain the seeds of protectionism and trade discrimination against "outside" countries.

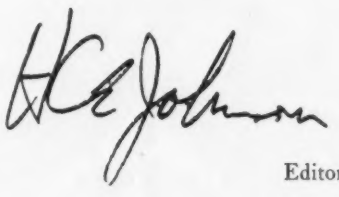
For example, the free-trade zone treaty—signed by the foreign ministers of Argentina, Brazil, Chile, Mexico, Paraguay, Peru and Uruguay, and likely to be ratified into effect early in '61—is expected to result in high external trade barriers to begin with, followed by reduced internal restrictions.

Despite indications of trade discrimination, and though some observers expect the free-trade zone to fail because of traditional nationalistic feelings, the U.S., we believe, should support the bloc and help to guide it toward the principles of freer trade as expressed in GATT.

We believe that if we are to continue to have Latin America as a "good neighbor," a lucrative trading partner, and as a significant investment outlet (in '58 our direct, private investment position in Latin America was $8.7 billion, second only to our position in Canada), the U.S. must take these positive steps suggested by the Latins themselves:

- Support the free-trade zone treaty when it is submitted to GATT.
- Offer constructive criticism in inter-American conferences and business gatherings on integrating the zone into the Western Hemisphere's trade and investment structure (a major opportunity for CPI management).
- Provide loans to private Latin-American industrialists seeking to expand their enterprises to take advantage of the zone-created market of 140 million people.

Latin Americans are determined to solve their economic problems. They would like our help and understanding. But they are prepared to solve those problems with the help of other nations if we fail to take advantage of the opportunity. With the Soviet Union standing by anxious to capitalize on our Latin-American mistakes, we cannot afford the luxury of a negative, or even passive, attitude.



Editor-in-Chief

# MAKE MONEY WITH FRONTIER TECHNICAL GRADE CHLOROFORM BY THE CARLOAD

Maybe chloroform is helping you make money as a chemical intermediate . . . in pharmaceuticals, in fluorocarbon plastics, in aerosols, in refrigerants. Or maybe this profitably versatile chloromethane has a yet undisclosed place in your formulations. We'd like to help you exploit it . . . and to supply you with chloroform by the carload from our centrally located Wichita plant. Frontier is a basic producer of chloromethanes, and of PerSec®, Clorofume®, BHC, Penta, muriatic acid, anhydrous HCl and caustic soda. We shall welcome your inquiry.

**FRONTIER CHEMICAL COMPANY** P. O. BOX 545 WICHITA, KANSAS

*division*
VULCAN MATERIALS COMPANY

# Chemical Week

Robert S. Muller ..... Publisher

Howard C. E. Johnson ..... Editor-in-Chief

Ralph R. Schulz ..... Managing Editor
J. Robert Warren ..... Assistant Managing Editor
Emil J. Mikity ..... Assistant Managing Editor
Donald P. Burke ..... Associate Editor
Anthony J. Piombino ..... Associate Editor

## DEPARTMENTS

**Administration** ... Cooper R. McCarthy, *editor;* F. Bryan Williams
**Business News** .. Homer Starr, *editor;* Bruce Bendow; Jane B. Munger
**Engineering** ..... Kenneth C. Wilsey, *editor;* Ryle Miller
**Markets** ..... Jorma Hyypia, *editor;* Philip A. Cavalier
**Production** ..... Herbert C. Short, *editor;* Walter E. Andrews, Jr.
**Research** ..... Joseph F. Kalina, *editor;* Philip A. Untersee
**Sales** ..... Leo J. Northart, *editor;* Carl A. Hiester
**Reports** ..... Vincent L. Marsilia, *editor*
**Specialties** ..... Richard J. Callahan, *editor;* Marion L. Meade
**Copy** ..... William Mullinack, *editor;* Henry S. Gordon
**Art** .. Robert T. Martinott, *director;* Richard Kluga, Forbes Linkhorn, Dolores Able
**Buyer's Guide** ..... E. L. Sisley, *editor;* Betsy L. Emery

## REGIONAL EDITORS

**Chicago:** John M. Winton, 520 N. Michigan Ave.
**Houston:** Thomas H. Arnold, 724 Prudential Building
**San Francisco:** Martin D. Robbins, 68 Post St.

## NATIONAL AND WORLD NEWS

**Economics** ..... Dexter M. Keezer
**Director, News Bureaus** ..... John Wilhelm

**Atlanta** ..... B. F. Barnes
**Chicago** ..... Stewart Ramsey
**Cleveland** ..... Arthur Zimmerman
**Dallas** ..... Marvin Reid
**Detroit** ..... Donald MacDonald
**Los Angeles** ..... Kemp Anderson, Jr.
**San Francisco** ..... Jenness Keene
**Seattle** ..... Ray Bloomberg
**Washington** ..... George B. Bryant, Jr.
Correspondents in 78 principal cities.

**Beirut** ..... O. M. Marashian
**Bonn** ..... Morrie Helitzer
**Caracas** ..... John Pearson
**London** ..... John Shinn
**Melbourne** ..... Alicja Grobtuch
**Mexico City** ..... Peter Weaver
**Moscow** ..... Ernest Conine
**Paris** ..... Robert E. Farrell
**Tokyo** ..... Sol Sanders
Correspondents in 78 principal cities.

Knox Armstrong ..... Advertising Sales Manager

**Business Department** ..... Alvin J. Babkow, manager
**Sales Promotion Department** ..... Fred E. Lesner, manager
**Market Research Manager** ..... Margaret J. Swikart
**Advertising Makeup** ..... Robert L. Maier
**Advertising Salesmen** ..... See. Adv. Index, p. 82
**Circulation Manager** ..... Paul W. Erb
**Reprints** ..... Frances Regan

**APRIL 2, 1960** **Vol. 86, No. 14**

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE EDITORIAL, CIRCULATION and ADVERTISING OFFICES: McGRAW-HILL BUILDING, 330 West 42nd St., New York 36, N.Y. See panel below for directions regarding subscriptions or change of address. **Officers of the Publications Division:** Nelson L. Bond, president; Shelton Fisher, Wallace F. Traendly, senior vice-presidents; John R. Callaham, vice-president and editorial director; Joseph H. Allen, vice-president and director of advertising sales; A. R. Venezian, vice-president and circulation coordinator. **Officers of the Corporation:** Donald C. McGraw, president; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, executive vice-presidents; L. Keith Goodrich, vice-president and treasurer; John J. Cooke, secretary.

**Subscriptions to Chemical Week are solicited from management men in the Chemical Process Industries in administration, production and plant operation, design and construction, research and development, sales and purchasing. Position, company connection and nature of company's business, products and approximate number of employees must be indicated on subscription application. Send to address shown in panel below.**

United States and United States possessions subscription rate for individuals in the field of the publication, $3 per year; single copies, 50¢. Foreign subscription rates per year: Canada, $4; other Western Hemisphere countries, $15; all others, $25, payable in advance. Printed in U.S.A. Title registered in U.S. Patent Office.


© Copyright 1960 by McGraw-Hill Publishing Co. Inc. All rights reserved. **Unconditional Guarantee:** the publisher, upon direct request from any subscriber to our New York office, agrees to refund the part of the subscription price applying to copies not yet mailed.


Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week, 330 West 42nd St., New York 36, N. Y. Subscribers should notify Fulfillment Manager promptly of any change of address, giving old as well as new address, and including postal zone number, if any. If possible, enclose an address label from recent issue of Chemical Week. Please allow one month for change to become effective.

THE BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES



**BARNSTEAD DEMINERALIZERS**

Barnstead Mixed-Bed Demineralizers are designed for industrial water demineralization jobs. Come completely equipped, ready to connect to raw water supply. Removes all ionizable impurities including silica and carbon dioxide . . . high electrical resistance — often up to 20,000,000 ohms per cc., and higher. Write for NEW Demineralizer Catalog #160. Describes Barnstead Mixed-Bed, Two-Bed, and Four-Bed Demineralizers.

**BARNSTEAD WATER STILLS**

Barnstead Industrial Water Still with capacity of 300 gallons per hour of distilled water of consistently high purity . . . Other industrial models with capacities up to 1000 gallons per hour. Catalog "G" describes Barnstead's complete line . . . over 200 different models and sizes for laboratory and industrial use.

TRADE MARK REG. U.S. PAT. OFF.
**Barnstead**
STILL AND STERILIZER CO.
81 Lanesville Terrace, Boston 31, Mass.

# Put Jefferson on your problem-sharing plan

Jefferson's experienced marketing and technical service people are trained expressly to help you do a better job. Share your problems with the respective specialists in oxide-glycol products, specialty chemicals, commercial development chemicals, or Private Label Anti-freeze.

More often than not, they make helpful on-the-spot suggestions regarding specifications, shipping, storage and applications. When other action is indicated, these marketing-service men will expedite your interests in detailed discussions or studies with Jefferson's veteran research chemists or production engineers. Chances are very good their answers will result in improved profit, product, or convenience for you.

Know these Jefferson men who serve your industry. Write for *Marketing Personnel Brochure* . . . Jefferson Chemical Company, Inc., 1121 Walker Avenue, P. O. Box 303, Houston 1, Texas.

HOUSTON • NEW YORK • CHICAGO
CLEVELAND • CHARLOTTE • LOS ANGELES

**JEFFERSON CHEMICALS**

# Business
## Newsletter

CHEMICAL WEEK
April 2, 1960

**Rexall Drug and Chemical may be going into petrochemicals,** possibly as a joint venture. The firm has added two more petrochemical experts to its rapidly expanding chemical division: Dr. Michael Erchak, Jr., formerly with Allied Chemical, and Blaine B. Kuist, previously with Fluor Corp. And, in his annual letter to stockholders, company President Justin Dart, names petrochemicals as one of the "principal fields" of future growth for the company.

**Best bet for Rexall: production of polyethylene.** Likely location: somewhere in the Gulf Coast area, with construction anticipated for late this year. Rexall uses about 50 million lbs./year of polyethylene in its Tupper, Chippewa and Imco divisions; is already producing about 25 million lbs./year of polystyrene.

•

**Kicking off the spring-summer construction season:**

• Air Reduction broke ground this week for its multimillion-dollar liquid-air separation plant at Tampa, Fla. Production capacity of the new plant: 25 tons/day of high-purity liquid oxygen plus liquid nitrogen and oxygen. It's expected that ultimately other Air Reduction divisions will be located at the Tampa site.

• Firestone officially broke ground for its Coral and Diene "natural-synthetic" rubber plant at Orange, Tex., with Jan. '61 now set as completion date for the 30,000-tons/year facility. Design engineers: Day & Zimmerman, Inc. (Philadelphia).

• British Titanium Products, Ltd., will begin construction soon of a $15-million titanium oxide pigments plant near Sorel, Que. (*CW, Dec. 19, '59, p. 26*).

•

**But Texas Gulf Sulphur will close its Galveston, Tex., operations,** start up its new, $3-million Beaumont facilities, with long-range plans for centering its entire sulfur operations eventually at Beaumont. Sulfur shipments from Galveston—which will be continued until year's end—have amounted to 12-15% of the world's 13-million-tons/year shipments. New docks in Beaumont, now open, will enable the company to ship both molten and dry sulfur from the same storage area. Liquid sulfur is obtained mainly from Spindletop Field near Beaumont.

•

**Lestoil-producing Adell Chemical will finally be acquired.** Founder Jacob Barowski—who has turned down numerous previous offers—will sell his specialties firm to Standard International Corp. (Andover, Mass.), a diversified holding company. Barowski—whose aggressive use of TV spot commercials helped boom Lestoil sales from $90,000 in '53 to $24 million last year—will continue to manage the concern.

**Other acquisitions—planned and completed:**

• Universal Oil Products has acquired controlling interest in The Trubek Laboratories, East Rutherford, N.J., specialty chemical manufacturer, for an estimated $6 million. The agreement provides for 100% ownership by UOP within two years, entirely through the use of cash generated by Universal operations.

• Cutter Laboratories expects to reach an agreement soon to acquire "an undisclosed firm in the pharmaceutical specialties field." The company is also discussing acquisition of a foreign company, has already formed Cutter Laboratories Pacific, Inc., as a 50%-owned Japanese affiliate now in manufacture of hospital appliances.

•

**Two types of "natural synthetic" rubber** are to be produced in England. Shell Chemical (London) plans to build a plant at Carrington that can produce either, or both, polybutadiene and polyisoprene, depending on demand. This plant—to be completed in '63—involves "an application of the Ziegler and Natta processes to synthetic rubber."

•

**The week brings three important executive shifts:**

• Monsanto's directors—in accordance with their age policy—have promoted 49-year-old Charles Sommer from executive vice-president to president and chairman of the executive committee. Charles Allen Thomas, 60, moves up from president to chairman of the board, succeeding Edgar Monsanto Queeny, 62. Queeny—son of the company's founder—will continue to serve as a director and chairman of the finance committee.

• Dow Chemical has appointed John Staudt, 50, to succeed Thomas Dolan as president of its Dobeckmun Co. division. Dolan, 69, will continue to serve as chairman of the executive committee for Dobeckmun, which he founded 33 years ago. Staudt has been executive vice-president of Dow's Dowell Division.

• B. F. Goodrich Chemical—a division of B. F. Goodrich—will have a new president May 1: Harry B. Warner, 43, now vice-president, marketing, previously vice-president, development. He will succeed John R. Hoover, 56, who will take early retirement April 30 after 35 years with the company.

•

**AFL-CIO's drive to organize Du Pont employees is on the rocks.** Last week brought three more rebuffs to the federation's organizers: at the Du Pont-operated Savannah River Works of the Atomic Energy Commission, at the Organic Chemicals Dept. plant at Antioch, Calif., and at the Industrial and Biochemical Dept. plant at La Porte, Tex. These three non-union decisions follow the recent poll at the big industrial chemicals plant at Belle, W. Va. (*CW, March 26, p. 88*) where employees turned down both OCAW and District 50, United Mine Workers.

# "Dad, where did I come from?"

"You came from Chase, son, and a lucky little chemical bag you are! Nobody knows more about bag materials and bagmaking than Chase. Chase makes its chemical bags of paper, textile, and polyethylene, or combinations of these materials. Every material is tested to assure maximum strength, minimum bulk, superlative moisture protection and lowest cost. And Chase engineers are continually solving packaging problems for the chemical industry. That's why you can now number among your relations a new, superstrong Chase Bag that permits safe storage of hygroscopic chemicals, even outdoors, for months... in any weather. Doesn't it all make you just glow with pride, son?"

*Feel an idea coming on? Call your Chase Man. Or a letter direct to us will bring complete facts about economical Chase packaging for any chemical product—even some semi-liquids.*

**CHASE BAG COMPANY**

355 Lexington Avenue - New York 17, N.Y.
32 Plants and Sales Offices Coast to Coast

MULTIWALLS • HEAVY-DUTY POLYETHYLENE • LAMINATED AND TEXTILE BAGS AND OTHER PACKAGING MATERIALS

# HOW *HERCULES* HELPS...

**CREATE NEW COMMUNITIES**—The name Levitt & Sons is synonymous with neighborhood planning and home building at a rate unprecedented in this nation. In ten years this firm will have completed homes to house more than 200,000 people in three separate "Levittown" communities. To keep pace with its exacting schedules, Levitt selected multicolor lacquer based on Hercules® Nitrocellulose for interior decorating. This paint—as modern as the concept of Levittown itself—can be applied in a single spray coating over any properly primed surface. Using multicolor, Levitt has designed a system that permits one man to apply a topcoat to a minimum of 8 houses in one working day. (Multicolor lacquer for Levittown, N. J., is "Multakolor," manufactured by United Lacquer Corporation, Linden, N. J., under license from Coloramic Coatings, Inc. and their own pattern for "Multakolor.")

**PROMOTE MODERN PACKAGING**—Whitey, an Avon product, is a unique new container designed to package a bubble bath solution, and to serve afterwards as an appealing, durable toy. It's typical of many containers for soaps, household chemicals, drugs and cosmetic products now being made with Hi-fax®, high-density polyethylene, one of three new Hercules plastics.

**PUT PERMANENCE IN PAPERS**—Because of the Hercules development of HXV® chemically modified cotton linters, the rag content can now be replaced for long-lasting documents such as ledger papers, stocks, bonds, and many other important papers that are symbolic of man's achievements. HXV is only one of the many Hercules ingredients that play an important part in papermaking.

*HERCULES POWDER COMPANY*
INCORPORATED
*900 Market Street, Wilmington 99, Delaware*

**CHEMICAL MATERIALS FOR INDUSTRY**

G60-3

*HERCULES*

## SPLIT-FINANCING PLAN FOR SHAVING ACETYLENE COSTS

Hypothetical figures based on proposal by Air Products, Inc.

**Base: 80-million-lbs./year hydrocarbon acetylene plant costing $20 million**

**CONVENTIONAL PLAN: 100% Internal Financing**

Goal: 10% annual return on **equity** investment

*Investment*: **$20 million**

*Return on investment (10%/year, after taxes)*: **$2 million**

. . . which would require before-tax net operating income of approximately

**$4,200,000/year**

**AIR PRODUCTS' PLAN: 25% Internal Financing, 75% Long-term Debt at 6% Interest**

Goal: 20% annual return on **equity** investment

*Investment*: **$5 million**; *bank loan:* **$15 million**

*Return on investment (20%/year, after taxes)*: **$1,000,000**

*Interest on bank loan (6%/year, before taxes):* **$900,000**

. . . which would require before-tax net operating income of approximately $2,080,000 plus $900,000 equals

**$2,980,000/year**

# Acetylene Plan: Lower Price, Higher Profit

**In the works: a bold plan — outlined above — to produce acetylene from natural gas at a price 10-12% lower than the acetylene-from-calcium-carbide price, and still earn a higher rate of return on equity. If the scheme works, it could profoundly affect the acetylene industry's long-range growth pattern.**

Such a plan—now being considered by Air Products, Inc. (Allentown, Pa.) as a serious possibility for 1962 operation — hinges on a combination of internal financing and borrowed capital. This kind of split financing — though previously used by Air Products for building oxygen plants — would be something of an innovation for the chemical industry.

Company officials tell CHEMICAL WEEK their plan would call for lining up a cluster of acetylene consumers around a proposed plant on the Gulf Coast. This would be similar to existing groupings of pipeline customers around calcium carbide-acetylene complexes such as those at Niagara Falls, N.Y., Calvert City, Ky., and Ashtabula, O.

**On Familiar Grounds:** Air Products figures that such a venture would be economically feasible for three reasons: (1) there should be inherent savings in serving multiple, close-at-hand customers; (2) a natural-gas-acetylene installation — with such additional products as nitrogen, oxygen and argon — would broaden the company's industrial gas business; and (3) the company would build, own and operate the partial-combustion plant, using an already tried financing formula.

In the hypothetical example of an 80-million-lbs./year plant costing about $20 million (*table, above*), conventional internal financing would require pretax earnings of $4.2 million/year to make an after-tax net profit of $2 million — representing a 10% return on invested capital. But with the split financing, the company would be able to apply the difference in pretax earnings requirements — $1.22 million/year — to price of the product, resulting in a 1.5¢ price cut, and still earn a 20% return on its equity in the plant.

Such "leverage financing" has been used by Air Products to build giant-size industrial gas plants adjacent to big steel mills and producing as much as 500 tons/day of oxygen, nitrogen and argon. Air Products also supplies practically all the liquid hydrogen and more than 75% of the liquid oxygen (LOX) used in the missile and space programs from plants it designed, built and now operates at several government installations. Most notable of these: the large-tonnage liquid-hydrogen plant near West Palm Beach, Fla., which the company built and operates for the Air Force (*CW, May 23, '59, p. 24*). It uses a Texaco partial-oxidation process. And the size and scope of the plant makes it somewhat comparable to the proposed acetylene venture, according to Air Products spokesmen.

Air Products units also make more than 30% of the oxygen used by the steel industry, and much of the gas consumed by chemical producers. Air Products customers include Jones & Laughlin, whose use of oxygen in steel production spurred the rest of the industry; Weirton Steel, Granite City Steel, Bethlehem Steel, U.S. Steel, Ford Motor Co. And just last year,

the company won oxygen supply contracts from three steel companies for which the company is building four large oxygen plants, totaling about $30 million.

Although the company has not yet decided which hydrocarbon-acetylene process it will use in its proposed venture, chances are it will use a version of the Badische Anilin- & Soda-Fabrik method—as do all the non-carbide acetylene plants now operating commercially in the U.S. (*CW, March 26, p. 45*).

Gordon Kiddoo, Air Products' general sales manager, says the BASF process would, at least, be a yardstick with which the company would compare any other process.

But despite Air Products' enthusiasm for the new project—it has gone so far as to set a target operation date in '62—the company is well aware of the widespread trade skepticism that has met similar acetylene-complex plans proposed in the past. These have invariably stumbled on a number of rock-hard obstacles. Toughest of these: lining up "the right customers."

Says Kiddoo: "We must put together an assortment of noncompetitive customers whose requirements are of comparable size. And our success will naturally depend on our being able to write suitable long-term contracts."

Another problem facing Air Products, if it's to keep the cost of acetylene production down, is in lining up additional customers for the by-products, carbon monoxide and hydrogen, which can be used in the synthesis of ammonia or methanol. It's possible that Air Products might undertake building and operating these and other chemical manufacturing units itself, if firm, long-term outlets were assured.

But the company asserts that the acetylene venture is the hardest—it will concentrate first on this. And although the plant would be laid out so it could eventually be expanded, Kiddoo says it would have only "a modest amount" of excess capacity.

Sites for the venture are under consideration between Houston and Baton Rouge. But again the company emphasizes that it will take several months to line up the contracts. As Kiddoo sees it: "The odds may be long. But the payoff would be big."

## Scurry over Citric

**Another race for a limited chemical market in Mexico is being run by U.S. chemical companies. This time the product is citric acid, and the contenders are Miles Laboratories and Bzura Chemical. A third company, Stauffer, is marking time.**

Interest in producing citric acid in Mexico arose last summer when a group of sugar growers decided to put up a plant (*CW, July 25, '59, p. 35*). Their plans were later suspended. Then, in December, Stauffer said its affiliate, Industrias Quimicas de Mexico, would put up a citric acid plant in central Mexico.

Two months later Miles revealed it had joined with Mexican investors to form a $1.5-million citric acid producing company, Quimica Mexama, S.A. (Mexico City). It was to start immediate construction of a plant designed to fill all of Mexico's citric requirements.

Then, a few days ago, Bzura declared it had set up a new wholly owned subsidiary, Productos de Fermentacion, and would put up a plant to "satisfy the entire Mexican demand" as well as supplying countries in Central and South America.

**Ready to Go:** Right now, the race seems to be narrowed down to Miles and Bzura. Stauffer says its plans are "in abeyance."

Miles says it has completed its engineering, ordered equipment, contracted labor, and will start construction "in the next week or so."

Bzura reports it has already shipped some equipment. This company hopes to gain time by dismantling additional equipment from its Fieldsboro, N.J., plant and sending it to Mexico. Bzura claims its Fieldsboro plant is now operating at double its designed rate of 8.5 million lbs./year.

One factor complicating the picture for prospective citric producers in Mexico has been the sugar situation. There's a one-year surplus waiting for consumption, but the Mexican sugar price is about three times the world price (3.08¢/lb.), and the sugar cane growers association, which has a monopoly, won't drop the price.

Bzura claims this gives it a raw-material price advantage. It says it can buy its starting material, molasses, for about 1¢/lb., while Miles must use the expensive sugar. Bzura admits it does not know Miles' total processing costs, however.

Bzura's report that it had won government approval for its wholly owned project surprised observers, who believed the government would stick to its policy of insisting on at least 51% Mexican ownership.

The citric race is reminiscent of last year's scurry between Du Pont and Glidden over which was to put up a titanium dioxide plant (*CW, Jan. 10, '59, p. 67*). The Mexican government, anxious to conserve foreign exchange, allowed only one plant, finally gave Du Pont the go-ahead when Du Pont agreed to take only a minor interest. Du Pont had already started construction.

## Chemical Sales Spurt

**Chemical operations of major petroleum companies have been prospering more than basic oil and gas activities, this week's corporate financial reports show.**

Shell Chemical says its '59 sales of chemical products mounted by nearly 21%, to a record $226.96 million, while the parent company's total sales and operating revenues rose by less than 8%. Physical volume of chemical sales also set a new record: up 14.4%, to 1.07 million short tons.

California Chemical Co. — the chemical arm of Standard Oil Co. of California, embracing Oronite Chemical, California Chemical International, and California Spray-Chemical operations—tells a similar story. Its '59 chemical sales were up 16.2%, to $143 million; the parent companies' total sales and operating revenues were up slightly more than 2%.

Standard Oil Co. (Indiana) reports that chemical product sales for '59 were up 36.7% to $36.5 million—nearly all of which was accounted for by its Amoco Chemicals subsidiary. Total sales and operating revenues climbed somewhat more than 5%.

Phillips Chemical does not report dollar sales volume, but data on physical turnover for three major products show fertilizer sales up 17.2%, to 877,758 tons; Philblack carbon black sales up 23.5%, to 247.2 million lbs.; and synthetic rubber sales up 18.7%, to 91,560 long tons. During the year, Phillips increased its capacity for ethylene and for methyl vinyl pyridine.

# Boost for Food Additives

**The U.S. Agriculture Dept. is preparing to step into the food additives hassle this week with a recommendation against the so-called Delaney amendment—which flatly bans any substance that might cause cancer. The department's attitude may be the best break that chemical manufacturers will get on this problem in view of the political power packed by the farm vote in an election year.**

Agriculture will recommend instead that more discretion be left to the scientists. In fact, USDA scientists are now preparing reports in answer to President Eisenhower's request to various government offices for expert opinion on the subject.

The reports are due in shortly, at which time the Budget Bureau will sift and compile them. Then the President's science advisor, George Kistiakowski, will recommend what stand the Administration should take.

Agricultural scientists will argue that in the Delaney amendment, Congress is imposing a political opinion on an essentially scientific problem. Nobody will propose that cancer-causing agents be allowed in food; but they will point out that scientists differ not only on how much of a carcinogen (cancer-causing agent) is permissible, but also what is, and what is not, a carcinogen.

**Necessary Component?** Selenium, for instance, is a normal and necessary component in animal feeds. Without it, the animal's white tissue structure will be deficient. But used in excess and under certain conditions, reportedly, it can cause cancer.

How effective the arguments will be is questionable. Understandably, no congressman will want to leave himself open to the charge that he voted for "a little bit of cancer."

The test will come soon on a Senate-passed color additives bill—which does not contain a "no-cancer" clause—when it comes to a vote in the House Commerce Committee. Health, Education & Welfare Secy. Arthur S. Flemming wants a no-cancer clause on the grounds that scientists at the National Cancer Institute say there is "no way of knowing whether a minute amount of carcinogen will cause cancer."

**Agriculture's Viewpoint:** "When this food legislation originally was drawn," says Dept. of Agriculture Research Director M. R. Clarkson, "the kind of food contamination we had in mind was real contamination. Now we're talking about parts/million or parts/billion, and before long it may be parts/trillion. You can carry this thing too far."

Clarkson emphasizes that he would like to see legislation "so drawn that there will be no hard and fast rules beyond the reach of scientists."

One example: stilbestrol—widely used as an additive in animal feeds to fatten cattle—under present methods, does not show up as a residue in meats. But testing methods, continually being refined, may one day turn up .0002 parts/million or billion, he says. Under present law, this would mean that stilbestrol, which can cause cancer, would have to be banned. The result: price of beef, Clarkson predicts, might shoot up 10%.

**Lag in Research:** The ever-present threat that an agricultural chemical will be condemned by the government is having a marked effect on research. For example, Chas. Pfizer & Co. is reported to have drastically cut back its research program on farm chemicals.

All in all, the chemical industry seems to be marking time to see what happens when the new season opens. According to Executive Secretary Lea Hitchner of the National Agricultural Chemicals Assn., three near-future events will determine what companies will do. Their actions hinge on:

- What government scientists say in their individual reports to the President. (A governor's committee in Wisconsin is also gathering scientific opinions.)
- What other scientists tell the House Commerce Committee in its consideration of a Delaney amendment for the pending color additives bill.
- What Congress does with the color bill.

If no margin is left for scientific discretion, companies presumably will cut back research expenditures—possibly resulting in a real food shortage problem at a later date. (Since '40, average corn yield/acre has been increased as much as 75% by use of chemicals; by the year 2000, the U.S. will need twice as much food to feed its expected population.)

**Government Research Up:** Meanwhile, the Agriculture Dept. expects to step up its own research program. It's asking for a $3.5-million R&D budget for next year, compared with $2 million this year. One object of government-sponsored research: preventing chemical residues from appearing in foods. And it's also experimenting with lures to attract insects to cardboard plaques impregnated with toxic chemicals to eliminate spraying of the actual crop.

One supporting plea for additional research funds came from the American Meat Institute, in hearings before the House Appropriations Subcommittee. Vice-President A. P. Davies called on the Agriculture Dept. to "take the lead in developing new chemicals, unique methods for their use, and biological methods for dealing with both diseases and pests."

## MH-30: Not Out

**Cigarette makers' opposition to use of a plant growth-regulating chemical—MH-30—is keeping the chemical's producer and distributors on the defensive in North Carolina this week.**

But U.S. Rubber Co.'s Naugatuck Chemical Division—producer of MH-30 maleic hydrazide formulations—is not throwing in the towel. Naugatuck Research Director H. D. Tate reiterates that this compound will not affect tobacco leaf quality if properly used; and he points out that North Carolina Agricultural Experiment Station will continue testing MH-30.

Naugatuck's efforts in behalf of MH-30 suffered a setback last week. Some newspapers and farm leaders misinterpreted a statement by Kenneth Keller, in charge of tobacco research at North Carolina State College, that he is not now recommending the use of MH-30.

Keller had cited the "strong opposition of six major tobacco companies" and his staff's failure up to now to find an assured method of applying the chemical to tobacco plants without causing changes in the leaf makeup.

A news article about this statement was headlined in one leading newspaper: "Chemical for Leaf Denounced."

## COMPANIES

**Strong Cobb Arner, Inc.,** is consolidating its two Canadian operations into a single subsidiary at Fort Erie, Ont. The new company, Strong Cobb of Canada, Ltd., will absorb both The Arner Co., Ltd. (Fort Erie), and Strong Cobb of Canada (Montreal). SCA, Inc., is a custom manufacturer of drugs, formed in mid-'59 through the merger of The Arner Co. (Buffalo) with Strong Cobb (Cleveland).

•

**B. F. Goodrich Chemical Co.** (Cleveland) has awarded a contract to C. F. Braun & Co. (Alhambra, Calif.) for additional vinyl resin and compound plant facilities under construction at Long Beach, Calif.

•

**Pierce & Stevens Chemical Corp.** (Buffalo) has registered with the SEC 175,000 shares of common stock for public sale by present holders, mostly members of the Stevens family. Offering price and underwriting terms have not yet been announced. This firm—with its two wholly owned subsidiaries, Cataract Chemical Co. and Pierce & Stevens Canada, Ltd.—manufactures and sells protective coatings, adhesive and solvent blends. The Stevens family now owns 70.5% of the 648,000 shares outstanding.

•

**Key Polymer** (Lawrence, Mass.), a newly formed corporation, plans production of polyurethane resins for coatings and adhesives. Jacob Lichman, formerly with Borden, will be general manager.

•

**Century Chemical Co.** has acquired the W. A. Butler Co. (Harrisonburg, Va.), an animal feed and supply company serving the Southeastern section of the U.S. It's said to be the first of a series of acquisitions of similar firms.

## EXPANSION

**Dry Adhesives, Resins:** The Borden Co. will spend more than $1 million at its Springfield, Ore., plant for a new-product development laboratory, a new, 1-million-lbs./year dry adhesives plant, and expansion of existing thermosetting adhesives and resins units. The dry adhesives plant is now being designed, additions to existing facilities are under way, and groundbreaking for the lab is scheduled for May.

•

**New Laboratories:** Chemical Process Co. (San Francisco) plans immediate doubling of its laboratory and office space.

•

**Automotive Fuels:** Shell Oil of Canada (Calgary, Alta.) plans a refinery for manufacture of automotive and domestic fuels. An industrial site southeast of Calgary is under consideration. Capacity will depend upon market developments and the time construction begins. Trade speculation is that the refinery will use condensate as feedstock, will be geared to handle 8,000 bbls./day.

•

**Epoxy, Polyurethane:** Trancoa Chemical Corp. (Reading, Mass.) will produce a new line of polyurethane and epoxy resins for coatings and adhesives. A. S. Cummin, previously with General Electric, will be in charge of development on both one- and two-component resin systems for Trancoa's new Plastics Division.

•

**Polymer Emulsions:** Polyvinyl Chemicals (Peabody, Mass.) will expand its polymer emulsion plant by 20 million lbs./year. The company makes emulsions for floor polish, textile sizes, leather finishes, shoe polishes and dressings and paper coatings.

## FOREIGN

**Fertilizers/India:** East India Distilleries and Sugar Factories, Ltd., has received government approval for a 51,000-tons/year fertilizer plant at Ennore, near Madras. The plant, slated for '62 operation, will also produce sulfuric acid, phosphoric acid and synthetic ammonia. Total investment: around $8 million.

•

**Petrochemicals/Japan:** Electro-Chemical Co. of Tokyo will embark on a six-year, two-step expansion program to start in '61. First step: an $80 million petrochemical plant at Goi, south of Tokyo. (Also planned near this site: Tokyo Power Utility's 300,000 kw.-capacity thermal power plant and Nippon Nitrogen's and Maruzen Oil's plants.) Acetylene, ethylene and propylene will be piped in from the Maruzen naphtha plant.

•

**Salt Processing/Algeria:** Farbwerke Hoechst, AG. (Frankfurt, West Germany) may participate in the construction of a plant for processing salt deposits at Arzew (near Oran), Algeria. The project's being initiated by the French firm Nobel-Bozel, which has been mining the salt deposits. Nobel-Bozel reportedly has acquired land for the chemical plant.

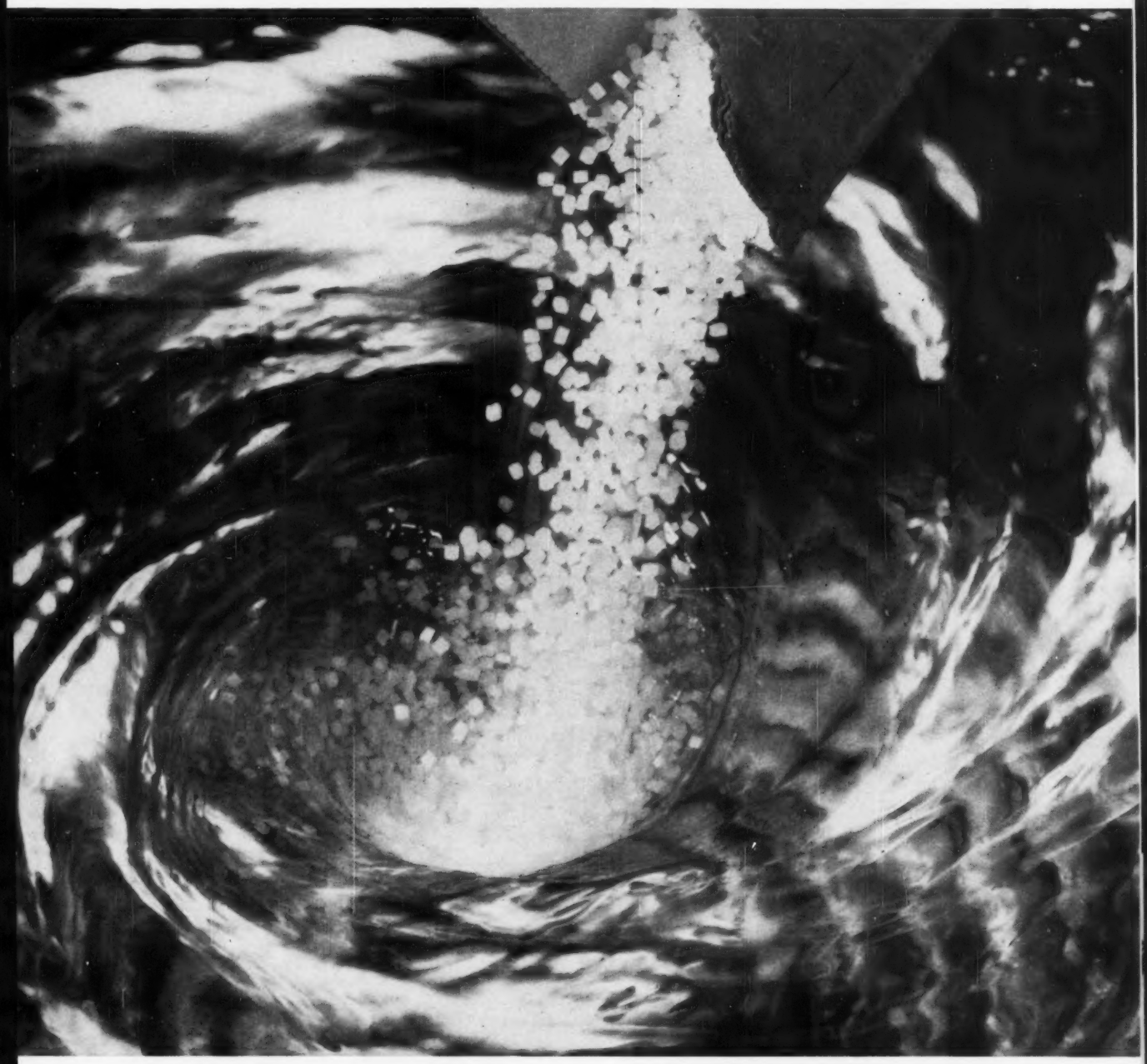
•

**Polyester/Czechoslovakia:** Imperial Chemical Industries (London) reportedly has licensed Czechoslovakia's state-owned chemical combine to manufacture its Terylene polyester fiber.

•

**Nitrogen Fertilizers/Egypt:** Demag-Elektrometallurgie (Duisburg, West Germany) has started construction of a giant water electrolysis plant for a nitrogen fertilizer factory at Aswan, Egypt. Demag is building the plant for Badische Anilin- & Soda-Fabrik, which holds a contract for a 400,000-tons/year calcium ammonium nitrate plant. First of the three units is reported nearing completion, with startup scheduled for late this year.

# now...an emulsifiable polyethylene to improve your water-based products!



A special *emulsifiable* grade of A-C® Polyethylene now makes possible the use of polyethylene to upgrade water-based products, especially where water resistance is the goal.

Examples: A-C Polyethylene is already being used to improve textile finishes . . . coatings for corrugated and paperboard containers...waxes and polishes . . . washable plastic paints. The paper industry is looking into it as a way to build greater wet strength into towels, tissues, and butcher paper.

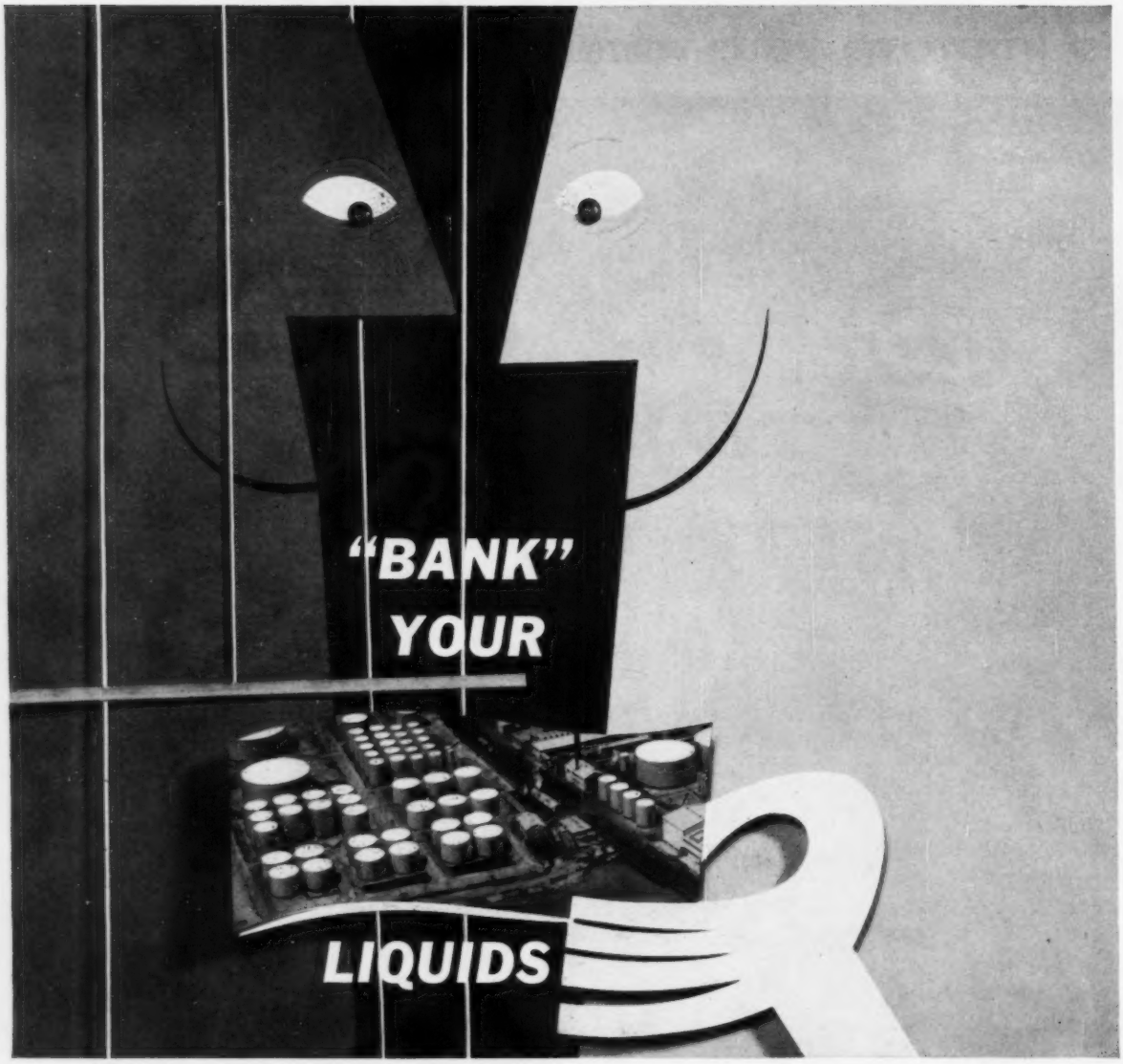
Yes, this polyethylene is *emulsifiable.* It forms stable emulsions in all systems—anionic, cationic, nonionic. Why not ask *your* technical people to evaluate A-C Polyethylene? Write us for samples and data at the address below.

Allied Chemical

**SEMET-SOLVAY PETROCHEMICAL DIVISION**

Dept. 573-AB, 40 Rector Street, New York 6, N. Y.

*National Distribution • Warehousing in Principal Cities*




# WHERE DEPOSITS & WITHDRAWALS ARE FLEXIBLE!

*General American Tank Storage Terminals give you a wide range of "in & out" handling methods!*

At General American's Tank Storage Terminals, you can bring liquids in or take them out by tanker, barge, tank car, truck, pipeline or packaged.

Today, the six General American Terminals offer you nearly 16,000,000 barrels of storage capacity. Terminals are located within 500 miles of *almost all* the top markets. You get these benefits:

- Complete privacy of storage.
- Maintain inventories to meet production needs and market conditions.
- Lease *what* you need *when* you need it.
- Avoid the capital expenditures of a tank storage terminal and its operation.
- General American's warehouse receipts are accepted as the highest type of collateral.

For further information, call or write our nearest district office or terminal.

*Terminals located at:*
Carteret, N.J. (Port of New York), Chicago, Ill., Corpus Christi, Texas (Port of Corpus Christi), Pasadena, Texas (Port of Houston), Galena Park, Texas (Port of Houston), Good Hope, La. (Port of New Orleans).

*GENERAL AMERICAN TANK STORAGE TERMINALS*
**GENERAL AMERICAN TRANSPORTATION** *a division of* **CORPORATION**
*135 South LaSalle Street, Chicago 3, Illinois*

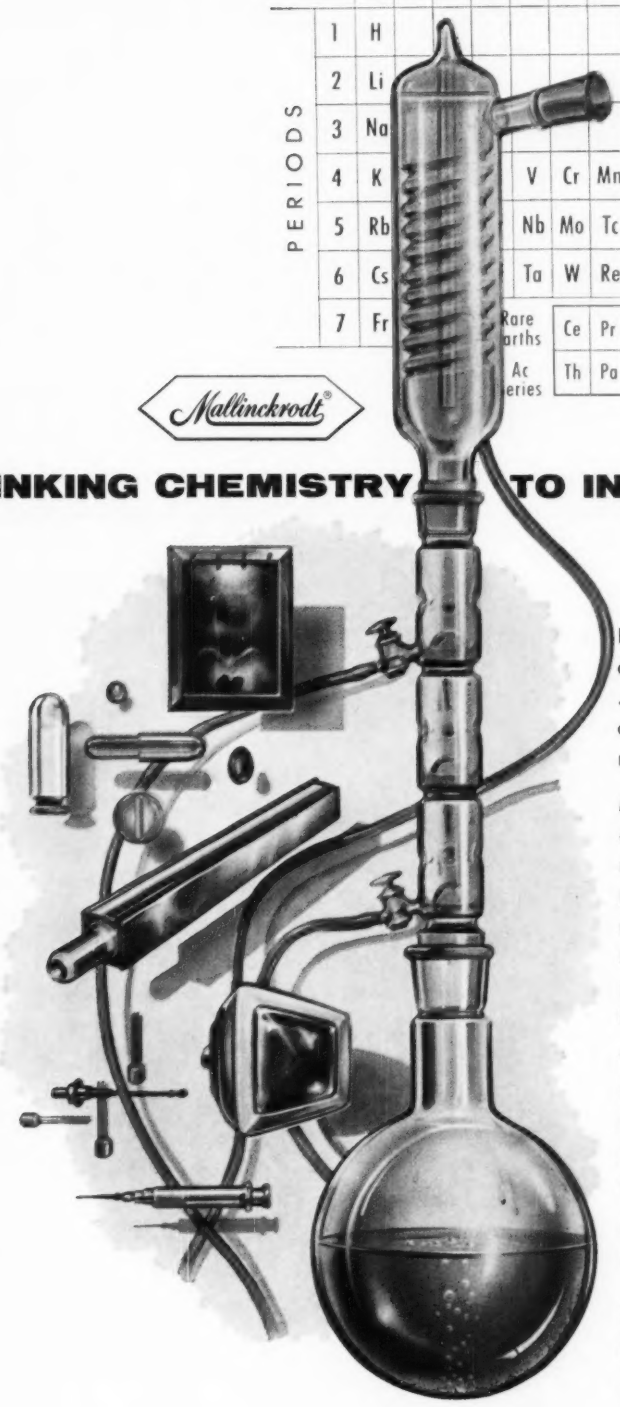
TANK STORAGE TERMINALS GENERAL AMERICAN TRADE MARK

PERIODIC CLASSIFICATION OF THE ELEMENTS

| GROUP | $I_a$ | $II_a$ | $III_b$ | $IV_b$ | $V_b$ | $VI_b$ | $VII_b$ | $VIII_b$ | | | $I_b$ | $II_b$ | $III_a$ | $IV_a$ | $V_a$ | $VI_a$ | $VII_a$ | $VIII_a$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PERIODS 1 | H | | | | | | | | | | | | | | | | | He |
| 2 | Li | | | | | | | | | | | | B | C | N | O | F | Ne |
| 3 | Na | | | | | | | | | | | | Al | Si | P | S | Cl | Ar |
| 4 | K | | | | V | Cr | Mn | Fe | Co | Ni | Cu | Zn | Ga | Ge | As | Se | Br | Kr |
| 5 | Rb | | | | Nb | Mo | Tc | Ru | Rh | Pd | Ag | Cd | In | Sn | Sb | Te | I | Xe |
| 6 | Cs | | | | Ta | W | Re | Os | Ir | Pt | Au | Hg | Tl | Pb | Bi | Po | At | Rn |
| 7 | Fr | | | | Rare arths | Ce | Pr | Nd | Pm | Sm | Eu | Gd | Tb | Dy | Ho | Er | Tm | Yb | Lu |
| | | | | | Ac eries | Th | Pa | U | Np | Pu | Am | Cm | Bk | Cf | Es | Fm | Md | No | |

Mallinckrodt®

# LINKING CHEMISTRY TO INDUSTRY AND MEDICINE



By developing special techniques in producing chemicals that meet the most exacting specifications ... Mallinckrodt has become a trusted source of dependable products for industry and the medical profession.

Mallinckrodt's line of fine chemicals is highly diversified. It ranges from ether for anesthesia to uranium compounds for nuclear reactors ... from reagents for chemical analysis to fungicides for combating turf disease on the golf course. High-purity Mallinckrodt chemicals become part of many pharmaceutical preparations and are used by other industries in products from TV tubes to jet engines.

There are three factors behind Mallinckrodt's versatility and capability: a high degree of technical skill ... the ability to put this skill into practice ... and the determination to reach predetermined goals without compromise.

Mallinckrodt's experience, facilities and ingenuity can be part of your future. Contact our technical division.

**BULK PHARMACEUTICALS • LABORATORY CHEMICALS**
**MEDICINAL PRODUCTS • COMMERCIAL URANIUM**
**TURF FUNGICIDES • INDUSTRIAL CHEMICALS**

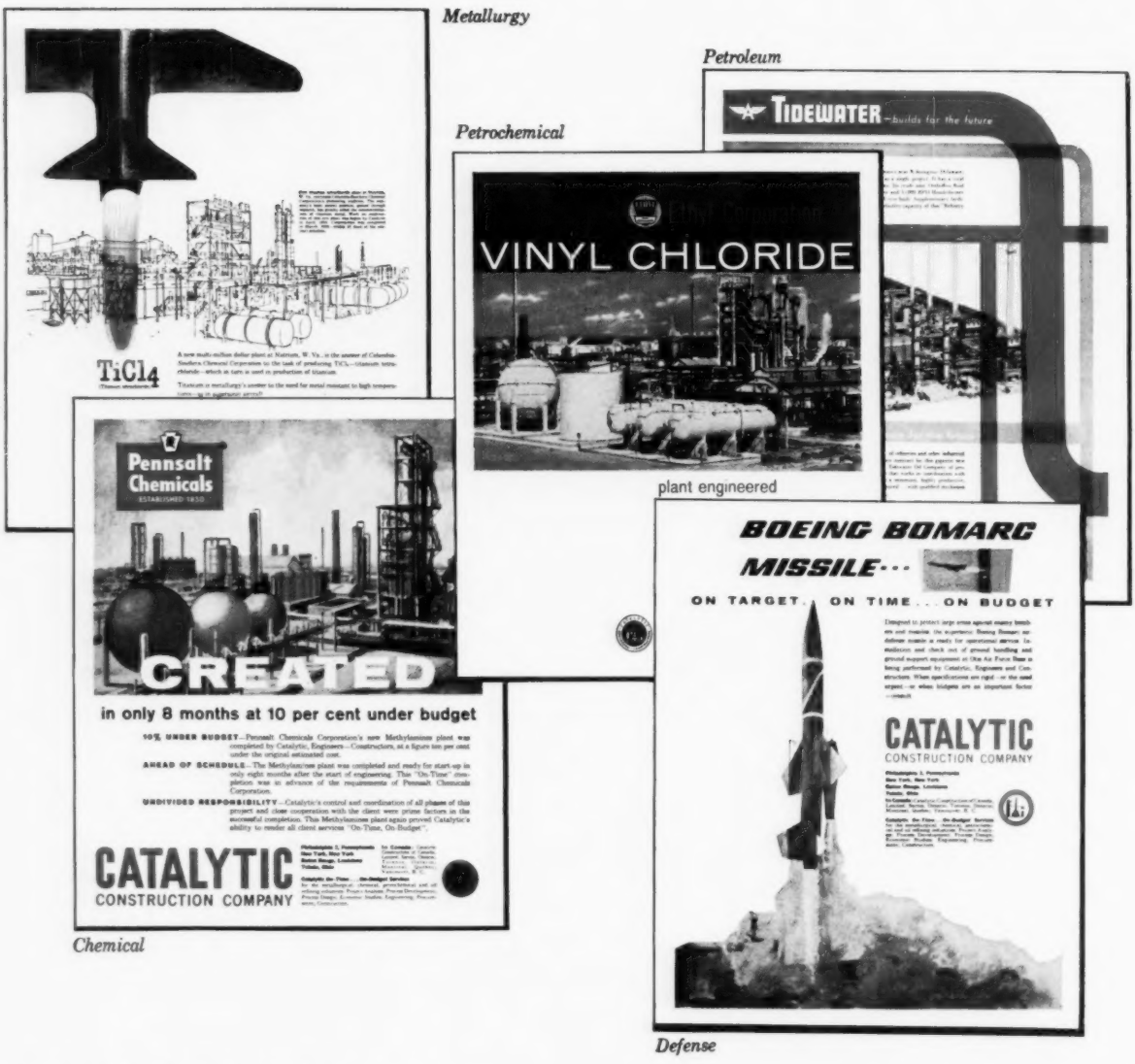
Mallinckrodt®

**MALLINCKRODT CHEMICAL WORKS**

**St. Louis 7, Mo.** **New York 8, N. Y.**

CHICAGO • CINCINNATI • LOS ANGELES
PHILADELPHIA • MONTREAL • TORONTO

TODAY WE MEET OUR STANDARDS—TOMORROW WE EXCEED THEM. AFTER 92 YEARS, IT'S A HABIT.


Metallurgy
TiCl4
Petroleum
TIDEWATER—builds for the future
Petrochemical
VINYL CHLORIDE
plant engineered
Pennsalt Chemicals
ESTABLISHED 1850
CREATED
in only 8 months at 10 per cent under budget
10% UNDER BUDGET—Pennsalt Chemicals Corporation's new Methylamines plant was completed by Catalytic, Engineers—Constructors, at a figure ten per cent under the original estimated cost.
AHEAD OF SCHEDULE—The Methylamines plant was completed and ready for start-up in only eight months after the start of engineering. This "On-Time" completion was in advance of the requirements of Pennsalt Chemicals Corporation.
UNDIVIDED RESPONSIBILITY—Catalytic's control and coordination of all phases of this project and close cooperation with the client were prime factors in the successful completion. This Methylamines plant again proved Catalytic's ability to render all client services "On-Time, On-Budget".
CATALYTIC
CONSTRUCTION COMPANY
Chemical
BOEING BOMARC
MISSILE···
ON TARGET... ON TIME... ON BUDGET
CATALYTIC
CONSTRUCTION COMPANY
Defense

VERSATILITY... Engineering, construction and maintenance accomplishments in a variety of specialized fields demonstrate the versatile part CATALYTIC plays in today's industry.

Our scope includes complete technical services for the petroleum, petrochemical, chemical, metallurgical, nuclear and defense industries.

Our reputation—"On Time—On Budget."

# CATALYTIC

CONSTRUCTION COMPANY

PHILADELPHIA 2, PENNSYLVANIA

In Canada: Catalytic Construction of Canada, Limited; Sarnia, Ontario

Mercadium Colors are a unique chemical pigment development patented by Imperial. The properties of mercadium colors are such that they are both versatile and useful in plastics as well as paint and enamel finishes and printing inks. Compounded of the sulfides of mercury and cadmium, mercadium pigments have permanent non-bleeding, heat resistant characteristics that make new color effects possible within the range of shades from dark maroon through light orange.

*Imperial*
**MERCADIUM®**
*pigments for industry*

*World's largest producer of chemical pigment colors*

For samples and further information, see the Imperial representative or write to

**IMPERIAL COLOR CHEMICAL & PAPER**
PIGMENT COLOR DIVISION, **GLENS FALLS, N. Y.**
*a department of Hercules Powder Company* INCORPORATED

Boston • New York • Philadelphia • Pittsburgh • Cleveland • Detroit • Cincinnati • Atlanta • Louisville • Chicago • St. Louis • Kansas City
Houston • Dallas • New Orleans • Los Angeles • Oakland • San Francisco • Portland • Seattle • Toronto, Ont. • St. Johns, Que. • Vancouver, B. C.

# NEW FROM CANCO...
## SNAP-LOCK CAPTIVE CAPS!

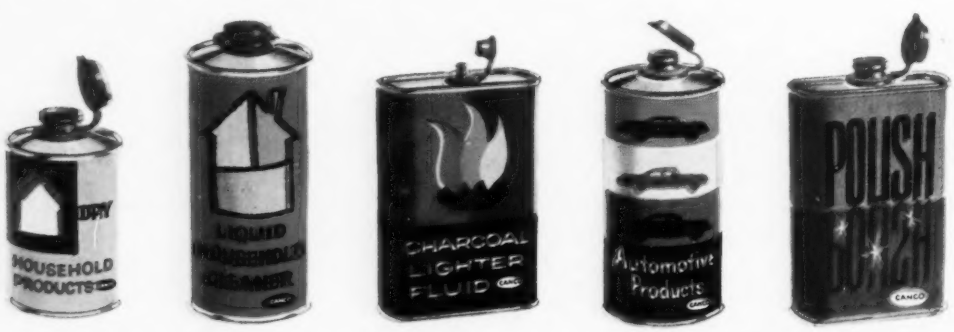
For the first time, a one-piece molded plastic closure for I-style or round metal cans. Cap snaps back, *stays* back as product is poured. Cap snaps down, *stays* down . . . locks as it closes. And because the cap is part of the fitting, it can't get lost.

These new plastic closures provide sales appeal and convenience . . . with economy! They are ideally suited to containers for products such as household cleansers, lighter fluids, polishes, and automotive products. They also give added sales appeal to packages for dry granulated products. Interested? Get the full story on Canco's new snap-lock captive caps from your Canco salesman.

AMERICAN CAN COMPANY

CANCO Division

NEW YORK • CHICAGO
NEW ORLEANS • SAN FRANCISCO



# Washington
## Newsletter

CHEMICAL WEEK
April 2, 1960

**Pricing of the new oral antidiabetic drugs** will be a key point of inquiry when the Kefauver drug probe resumes. It's being held up now by the drawn-out civil rights fight and Sen. Everett Dirksen's (R., Ill.) objections to letting the committee meet while the Senate is in session.

For years, insulin by injection was the only treatment for diabetes. In the last few years three oral diabetic drugs, which are helpful to some diabetics, have come on the market; they're made by Upjohn, Pfizer and U. S. Vitamin.

The Kefauver committee will ask about prices and patents. Before it gets to these, however, it will finish up the industry-wide phase with Dr. Austin Smith, president of Pharmaceutical Manufacturers Assn., and other spokesmen.

**PMA deplores the extreme propaganda** put out by outfits over which it has no control, attacking the drug probe and Kefauver personally. The association considers it extremely bad public relations.

A pamphlet titled "Communism in the Congress," with references to "Comrade Kefauver," was distributed by the Commonwealth Engineering Co. (Dayton, O.). The pamphlet was one of a monthly series circulated free to 5,000 executives around the country. In Tennessee, some pharmacists have run ads attacking the senator, too.

Kefauver faces a tough re-election fight in the August primary. State Circuit Judge Andrew Taylor, who ran second for governor last time around, is opposing him and using the "soft on civil rights" angle. Ex-Governor Frank Clement may also run, although observers think he is now more interested in waiting for another chance at the governor's chair.

•

**Government economists see a big gain in gross national product** for first-quarter '60, compared with the same quarter last year. The prediction is made officially by the Commerce Dept. Inventory buildup contributes significantly to pushing business activity to new, high levels.

The department's survey notes that momentum gained in catching up with the steel strike is about concluded. From now on, economic movements are likely to be shaped by the more traditional factors affecting supply and demand.

**Inventories for chemicals are down slightly from a year ago.** Petroleum and rubber run about the same. But inventories generally are in a better balanced position as a result of a $1.3-billion rise in stocks during December and January. The two-month increase offset the liquidation that occurred earlier.

## Washington Newsletter

(Continued)

**Chemical content in sewage and industrial waste** defies present methods of treatment, says a special report filed by the Public Health Service with the Senate Committee on National Water Resources. It suggests an intensified program of basic research to find out how to deal with detergents, chemicals and insecticides. Total combined national expenditure for water-pollution research is now less than $6 million/year, with the federal government spending less than one-third of that sum, says the report.

•

**A move to eliminate "sole source" procurement policies** in buying defense items has considerable support in Congress. It's one of the objectives of the Small Business Administration, as outlined to Congress last week.

Sole source procurement (only one contractor supplies specific defense materials) accounts for about 50% of defense buying, virtually excludes small firms. Another SBA request: extend to the subcontracting field the laws that now give small businesses a share of prime contracts.

•

**Little hope for new government support for mineral producers** is seen in this session of Congress. Even a late-starting compromise proposal for price supports or production bonuses for small mines is given scant chance.

A Tariff Commission report to Congress on domestic lead-zinc mining will provide ammunition for considerable debate—as well as a Western mining bloc effort to legislate higher tariffs on these two metals. But the commission is expected, for both legal and political reasons, to avoid any specific recommendations. This will take the steam out of any legislative push this year.

A bill by Sen. Vance Harkte (D., Ind.) to put a 4¢/lb. import tariff on pig aluminum is viewed as a protest for the record against increasing imports of the metal. Given no chance of passage, it represents the position of West Coast companies, but is not wholeheartedly supported by other elements of the domestic industry.

•

**Efforts to find a formula for "equitable sharing" of profits** between company, union and public, in the steel industry—and a possible pattern for other industries—has run into trouble.

A tripartite steel labor team with an arbitrator in charge was set up after the big strike with hopes of finding a peace formula to end recurring steel strikes. It has hit two big snags: (1) increasing automation, which will displace thousands of steelworkers in the next few years; (2) the incentive system, which steelworkers will cling to but which pushes their hourly wages out of balance with other industries.

# CITRIC ACID

BZURA introduces the production of Citric Acid, U.S.P. from the most basic carbohydrate source — cane blackstrap molasses.

BZURA has succeeded in the development of a rapid and unique deep fermentation process that allows the large scale commercial production of Citric Acid and satisfying the most exacting purity and mesh requirements.

For the first time BZURA's continuous pioneering in special fermentation techniques makes available a new constant and dependable source of U.S.P. Citric Acid . . . either Hydrous or Anhydrous to suit your specifications.

Write for informative literature which describes our company and products.

FERMENTATION

BZURA

CHEMICALS

**BZURA CHEMICAL COMPANY INC.**

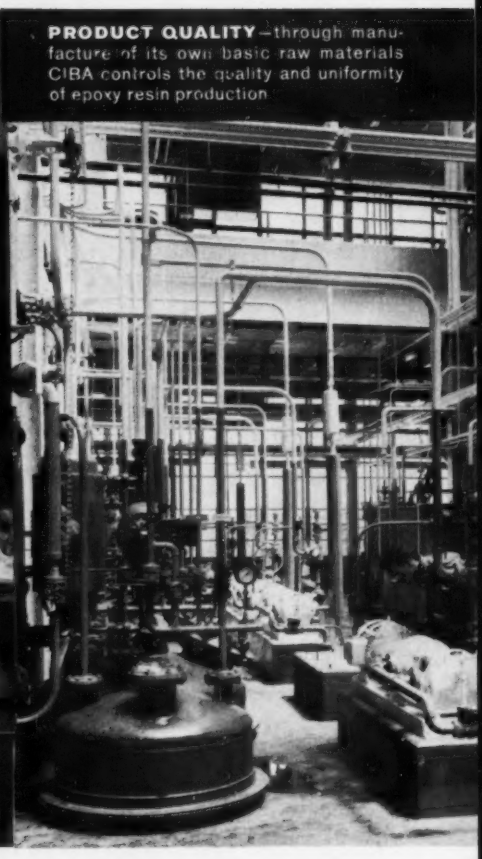
Keyport, New Jersey/Plant: Fieldsboro, New Jersey

From CIBA | EPOXY | Research...

# STEPPING STONES TO PROFITABLE PRODUCT DEVELOPMENT

**RESEARCH**—the combination of pioneering epoxy development and world-wide experience enables CIBA to maintain continuing leadership in resin technology.

**TECHNICAL-SALES SERVICE**—individual attention geared to practical customer needs.



**PRODUCT QUALITY**—through manufacture of its own basic raw materials CIBA controls the quality and uniformity of epoxy resin production.

Successful marketing starts with products that set the competitive pace. CIBA Epoxy Resins are helping to build such products in ever-widening fields through effective application of the unique combination of properties found in this remarkable engineering material pioneered and developed by CIBA. "The Epoxy Building Block" a new CIBA booklet presents all general property and application data in handy cross-reference pages, and representative case histories demonstrate the opportunities for new product development and present product improvement CIBA Epoxy Resins are making possible. Your copy may be obtained without obligation by addressing CIBA Products Corporation, Fair Lawn, N. J.

C I B A

**FIRST IN EPOXIES**

For use in adhesives · electrical components · floor and pavement toppings · industrial and architectural coatings · laminating · tooling · printing inks · vinyl stabilizers and many other applications.

*'We have to get the business, give service, be competitive in foreign markets. But the days of U.S. chemical exports are passing.'*

*'We believe that the expanding world population will result in steadily increasing demand for agricultural chemicals and products indigenous to the U.S.'*

# Defining Exporters' Dilemma

**This week American businessmen were viewing with mixed reactions the government's just-launched drive to bolster sagging U.S. exports. But chemical process industries executives —many of whom feel that U.S. chemical exports are on the way out —are not waiting for the verdict. They're now taking stock, strengthening their export efforts in hopes of making a good showing in the international marketplace.**

At the heart of the problem lie two key factors: (1) U.S. exporters are losing—for a variety of reasons—valuable overseas markets to foreign competition, and (2) the shrinking U.S. balance-of-trade over the past two years—while other foreign commitments remained almost as high as before—resulted in deficits on the over-all balance-of-payments of almost $4 billion/year over the same two-year period.

**CPI Reactions:** CPI export managers and international executives appear convinced that at least part of the problems stems from ineffective selling techniques and poorly organized export operations. To remedy this, many concerns are revamping their U.S.-based headquarters operations, reorganizing their field-sales forces—including their foreign agents and distributors setups—and shopping around for new ways to hold onto and increase foreign markets.

Witco Chemical Co. (New York) is one such company. But, while the company is reorganizing for export sales, it is doing so with the conviction that U.S. exports shortly will give way to sales by foreign-based U.S. subsidiaries.

Says Witco's Bill Wishnick, executive vice-president, head of the international division and president of the concern's Canadian company, "The days of chemical exports from the U.S. are passing. There's a desire to manufacture locally. We expect to move our carbon black production to Europe to service local markets."

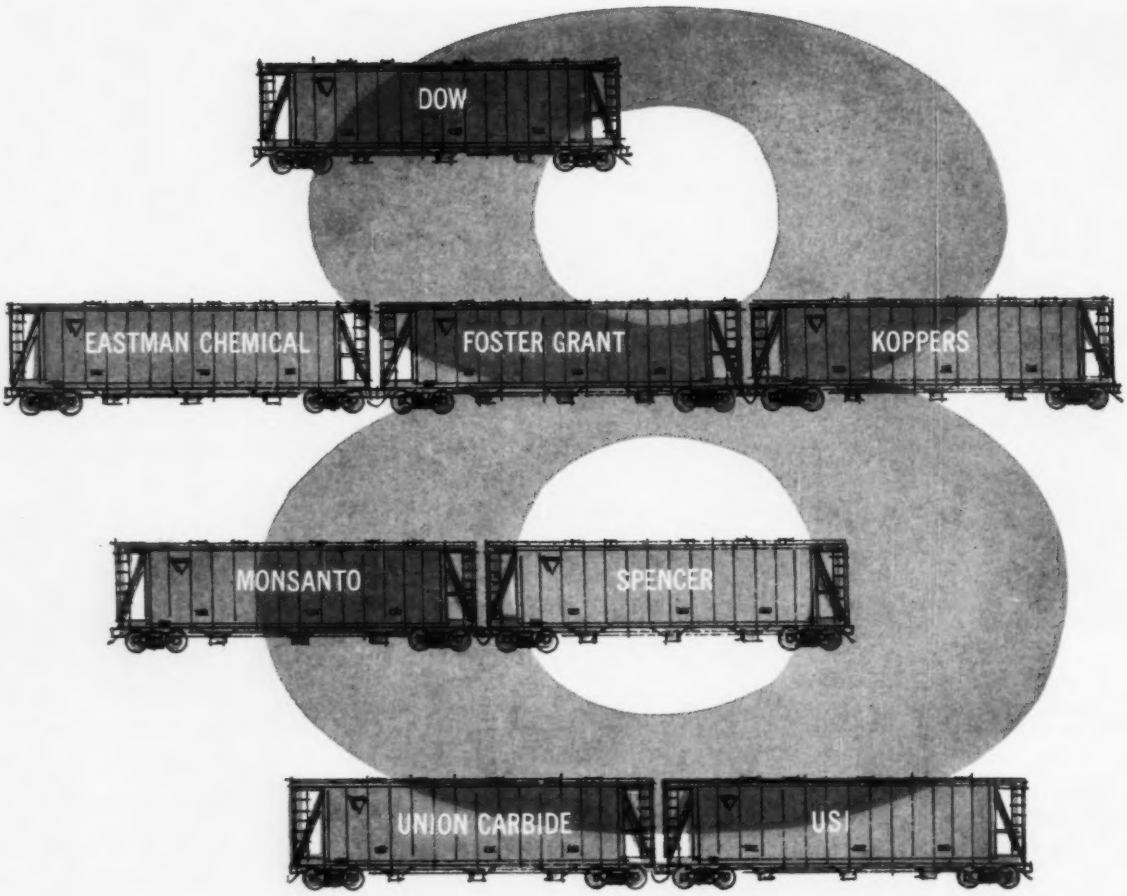
Wishnick, who also coordinates the company's licensing activities, cites as encouraging a "tremendous interest in U.S. know-how abroad." And, he adds, "there will continue to be specialty product export opportunities for some time."

Witco's exports and foreign affiliate sales are 10-15% of total sales. It deals largely through its agents under the direction of the U.S.-based export department within the international division. The export manager works closely with foreign agents and with U.S. firms ordering for their overseas subsidiaries.

On the question of selling direct or through agents and distributors—a major decision for any firm doing business abroad—Wishnick says it depends on the products and circumstances. "The important thing is to get the business, give service and be competitive. How you sell depends on the products and the area. For example, carbon black often is sold direct, because there's sufficient volume."

Witco manufactures and sells industrial and specialty chemicals and carbon black, and is the exclusive worldwide distributor for Continental Carbon Co.—carbon black producing affiliate of Witco, Continental Oil Co., and Shamrock Oil and Gas Corp. Witco sells carbon black direct in France and the Netherlands, through agents in Italy.

The company manufactures and sells stearates in Canada through its 100% owned subsidiary, Witco Chemical Co. Canada Ltd. (Oakville, Ont.). Witco also owns all of the




# 8 major chemical companies are now using the **DRY-FLO® CAR** for bulk shipment of **POLYETHYLENE** and **POLYSTYRENE**

*Ask the nearest General American office about the advantages of bulk shipment for your product.*

DRY-FLO GENERAL AMERICAN TRADE MARK

Airslide® and Dry-Flo® Car Division
**GENERAL AMERICAN TRANSPORTATION CORPORATION**
*135 South La Salle Street • Chicago 3, Ill. • Offices in principal cities*

*The Dry-Flo® car provides maximum sanitation and full protection for materials that require careful handling.*

interest in P. N. Soden & Co., Canadian chemical distributor.

Organizing and supervising force for Witco's expansion in the European Economic Community is its wholly owned subsidiary in the United Kingdom, Witco Chemical Co. Ltd.—the U.K.'s major custom compounder of natural and synthetic latexes used in the manufacturing and processing of automobile insulation, floor coverings and adhesives. The U.K. subsidiary also is exclusive agent for carbon black sales in England, has its own agents on the Continent.

In France, Witco sells through Witco Chemical du France S.A.R.L., a new subsidiary of its U.K. affiliate. Its carbon-black producer — Compagnie Francaise du Carbon Black, a joint venture of Continental Carbon and Phillips Petroleum—will bring on-stream late this year a 56-million-lbs./-year carbon black plant at Bordeaux.

Further examples of Witco's blossoming forth in international markets can be seen in joint ventures—between Continental Carbon and Columbian Carbon—in the Netherlands and Italy. In addition, a recently established office in Rotterdam is headquarters for the distribution of carbon black made in Holland.

A major problem of selling abroad, the youthful Wishnick confides, is that of the current credit situation. "Many foreign companies are running rings around us on credit extensions. And we can't very well put our credit risks in the sales price." But, commenting on the possibility of government credit guarantees, Wishnick says, "We don't care too much for too many government guarantees."

**More Liberal Credit Attitudes:** On the vital subject of foreign credit policy, Allied Chemical Corp.'s Wesley Wickersham, vice-president, Allied Chemical International, has said that his company has had to take a more liberal attitude. Behind this move, he said, is mounting competition within the international marketplace, with foreign competitors setting the pace in liberalizing credit.

Allied International maintains offices in Mexico City and Brussels, has field representatives in Latin America and the Far East. The company sells exclusively through distributors, which, in turn, are supported by the concern's branch offices and field representatives appointed for promotional, technical and liaison work.

Allied International President William Winfield tells CHEMICAL WEEK that the principal advantages to this system are:

- Use of the distributor's local knowledge, contacts and influence.
- Identification with local nationals.
- Support and stimulant effects provided by Allied's own local branch offices and representatives.
- Maintenance of direct contact with foreign markets and intelligence channels through local branch offices and field men.

Regarding the future of U.S. exports, Allied shows a bit more optimism than some CPI concerns. Says Winfield, "We believe from past and present trends that the expanding world population will result in a steadily increasing demand for agricultural chemicals and products indigenous to the U.S., where labor and transportation costs are not a major factor in the price structure."

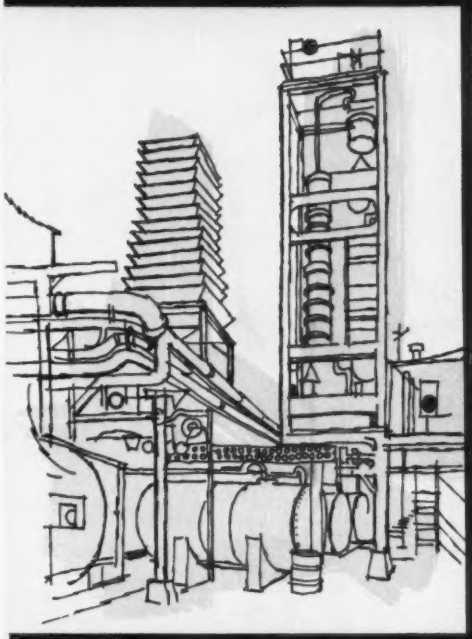
**Another Major Reorganization:** Akin to Witco's reorganization in scope is Stauffer Chemical Co.'s realignment for foreign selling. The New York company's international division—organized on paper in Jan. '58—even now is in the process of major shifts here and abroad.

The new division, formed with the export department as a nucleus, coordinates all export activities and foreign sales, sets up licensing programs (none existed before), picks up intelligence, creates subsidiary companies. Organization is along product lines; later there will be geographical subdivisions.

The number of Stauffer distributors overseas has been increased to some 100, and these are being realigned along product lines. Distributors are serviced by the division's export department, and technical representatives go out from offices in New York, Sao Paulo, Brazil, and Geneva, Switzerland. But despite extensive overhauling of its distributorship set-up, Stauffer points out that it's not without serious drawbacks. Says Francis MacMullen, general manager of the international division, "You can't have exclusive agents today, unless you can provide a full line of products to keep the staff busy." Stauffer registered slightly less than 10% of its '58 net sales of $159.3 million abroad.

*You get more than chemicals from*

**CARBIDE**



HIGH-VOLUME PRODUCTION
with
END-TO-END QUALITY CONTROL

Ample supplies of the chemicals you need are assured by CARBIDE's seven producing centers across the country. Quality control begins with raw materials, continues along production lines, and ends only when chemicals for shipment have been laboratory approved. CARBIDE's 18 bulk stations, 50 warehouses, and 28 sales offices mean quick service, fast deliveries.

When ready to place your next order—call our nearest office. Union Carbide Chemicals Company, Division of Union Carbide Corporation, 30 East 42nd St., New York 17, N.Y.

**UNION CARBIDE CHEMICALS COMPANY**

UNION CARBIDE

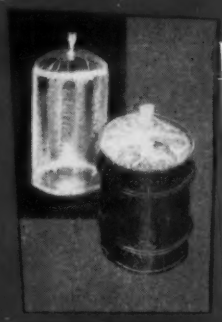
# PROTECTIVE'S

DOUBLE-SEALS

DRUM LINERS ★ BAGS ★ CARTON LINERS

ALL STYLES • ALL SIZES

Produced with fine materials:
POLYETHYLENE, POLYPROPYLENE, VINYL, LAMINATES
The largest manufacturer in the U.S.A.
concentrating on ROUND bottom and
STRAIGHT bottom LINERS . . . the FINEST!



NEW! DOUBLE WELD SEAL DRUM LINERS

BAGS

CARTON LINERS

*Double-Seal Guaranteed Safety...

# SUCCESS!

LOW, LOW, PRICES!

*"TWIN-SURE" DOUBLE-SEAL
straight bottom liners

*"DOUBLE WELD" POWER SEAL
round bottom liners

. . . originated and manufactured by the pioneers in plastic-liners for steel drums, fibre containers, cartons and boxes . . . successfully tested and proven satisfactory for protective packaging by many of America's leading manufacturers, processors and laboratories.

. . . ALSO BAGS LINKED ON ROLL: "PERF-O-BAG"

. . . here are just a few users of protective liners:

Allied Chemical & Dye Corp.
The Borden Company
Brookhaven National Laboratories
C-O-TWO Fire Equipment Company
E. I. duPont de Nemours & Co.
Endicott Johnson Corp.
General Electric Company
McKesson & Robbins, Inc.
National Lead Company
Chas. Pfizer & Co., Inc.
Swift & Company
Union Carbide & Carbon Corp.
U. S. Quartermaster Corps

Guaranteed Satisfaction
Free Consultation
Free Samples

Write Dept. CW 40

* TRADEMARK

## PROTECTIVE LINING CORPORATION

GENERAL OFFICES AND PLANT: 22 WOODHULL STREET, BROOKLYN 31, NEW YORK

Further reflecting the CPI's determination to gear up to face foreign competition, Stauffer has placed its international division on the operating division level, has MacMullen reporting directly to company President Hans Stauffer.

**More Activity Ahead:** And, in addition to its present subsidiaries in Argentina, France, Australia, West Germany, Mexico, Canada and Panama, Stauffer plans more subsidiary activity. A new (50% owned) West German subsidiary, Kali-Chemie-Stauffer, will be in operation by the end of the year producing Stauffer's brand of insoluble sulfur for the tire and rubber industries. And a Mexican subsidiary—which now produces carbon bisulfide, sulfuric acid, oleum and ammonium sulfate—has plans to build a citric acid plant in central Mexico.

A new, wholly owned Swiss company—Stauffer Chemical Co. International S.A. (Geneva) has been formed, essentially as a sales corporation, but with bigger plans ahead. The corporation (Stauffer made a $150,000 contribution) also will handle joint venture negotiations, coordinate activities of other European affiliates, search for technical know-how, set the stage for establishing production facilities. Says MacMullen, "Foreign competition has made it unprofitable to export, we'll have to produce abroad."

But for the present, Stauffer is pushing exports, looks for a profitable '60, especially from new agricultural chemicals Trithion and Eptam and several promising metal chloride products.

**Government's Two-Pronged Push:** The government's drive for increased exports has two prongs: one aimed at Congress, the other at U.S. businessmen. The program results from the conclusion that the only sound way to correct our over-all balance-of-payments deficit is to increase exports to pay for our increased imports, military outlays abroad, foreign investments and tourists' expenditures overseas.

In a special message to Congress

## Scoreboard for U.S. Chemical Exports

### Trends in Export Sales (million dollars)

| Industry | '58* | '59 | '58-59% change | '60 | '59-60% change |
|---|---|---|---|---|---|
| Chemicals | 1,476.2 | 1,535.2 | +4 | 1,550.6 | +1 |
| Paper | 303.6 | 297.5 | −2 | 318.3 | +7 |
| Rubber | 278.3 | 264.4 | −5 | 264.4 | 0 |
| Petroleum | 461.8 | 447.9 | −3 | 452.4 | +1 |
| All manufacturing | 11,884.2 | 11,965.1 | +1 | 12,442.9 | +4 |

Source: McGraw-Hill Dept. of Economics. *U.S. Dept. of Commerce.

### U.S. Share of World Markets* (percent change from '54-'56 to '58)

| Market Increases | | Market Decreases | |
|---|---|---|---|
| Inorganic chemicals | +27 | Fertilizers | −14.5 |
| Selected chemicals | + 4 | Paints | −12.0 |
| Scientific instruments | + 3 | Organic chemicals | − 9.0 |
| Copper | +34 | Paper | − 1.0 |

*Excluding Europe and Japan.

Source: U.S. Dept. of Commerce.

### Some Key '59 U.S. Chemical Exports (million dollars)

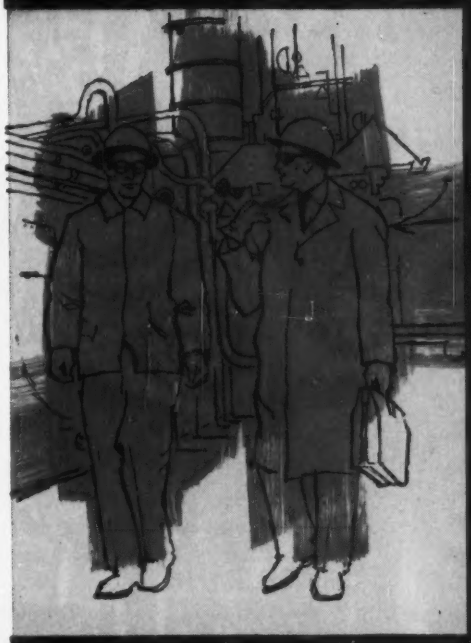
| Chemical | Country of Destination | | | | |
|---|---|---|---|---|---|
| | Benelux | France | Italy | W. Germany | Total EEC |
| Phenol | 0.6 | 1.2 | 0.4 | 0.1 | 2.3 |
| Styrene | 4.2 | — | 0.3 | 0.04 | 4.5 |
| Polystyrene | 7.3 | 0.4 | 0.7 | 1.6 | 10.0 |
| Polyethylene | 15.7 | 2.3 | 6.1 | 6.3 | 30.4 |
| Ethylene glycol | 7.9 | 0.4 | — | 1.2 | 9.5 |
| Titanium pigments | 0.9 | 0.8 | 0.8 | 0.06 | 2.4 |
| Synthetic rubber | 13.2 | 28.1 | 8.6 | 16.2 | 66.2 |
| Boric acid | 1.8 | 2.1 | 0.7 | 3.7 | 8.3 |
| Butanol | 3.4 | 0.02 | 0.7 | 0.5 | 4.6 |

Source: U.S. Dept. of Commerce.



*You get more than chemicals from*

**CARBIDE**



EXPERT
TECHNICAL SERVICE

In every one of CARBIDE's twenty-eight sales offices, there is a Technical Representative trained to help you select the right chemical for your particular requirements. He's backed by extensive Technical Service Laboratories, where chemical specialists help CARBIDE's customers resolve process problems . . . assist them to develop new products or processes . . . redesign existing products to take advantage of new, improved chemicals . . . provide information on methods and equipment for safely handling, using, and storing chemicals.

If you could use this expert chemical know-how, why not call our nearest office today? Union Carbide Chemicals Company, Division of Union Carbide Corporation, 30 East 42nd St., New York 17, N. Y.

**UNION CARBIDE CHEMICALS COMPANY**

UNION CARBIDE

# Wyandotte PLURACOLS suggest scores of uses

## ...can these polyglycols solve a problem for you?

Right now, the PLURACOL* polyglycols are improving products, smoothing processes in many of the nation's major industries . . . and their potential is just beginning to be realized. For, the PLURACOLS come in a broad range of physical forms and molecular weights to meet the most specific requirements.

There are four liquid, and six solid grades in the PLURACOL E series of poly*ethylene* glycols — four liquid grades in the PLURACOL P series of poly*propylene* glycols. PLURACOL E's are available with molecular weights from 200 to 6000, PLURACOL P's from 400 to 2000. The following applications may suggest how they can work for you:

**TEXTILES** — Softeners, lubricants, dispersants, and emulsifiers are all prepared from members of the PLURACOL E series. Because of their wax-like nature, the solid grades function as knitting sizes for many types of yarns.

**RUBBER** — PLURACOL E's offer a particularly suitable combination of properties for use as mold-release agents. Completely water soluble, they are easy to apply and remove. Their low volatility holds losses to a minimum. And because they are wholly organic, they leave no unburned residue in molds, and have no harmful effects on rubber.

**PHARMACEUTICALS** — PLURACOL E's have found an important use in this industry as anhydrous, stable, bland bases for external preparations. They contribute a mild humectant action to lotions, and are useful as binders and anti-dusting agents in various cosmetic preparations. Higher-molecular-weight grades have been used as lubricants, coatings, and binders for pharmaceutical tablets.

**PAPER** — Liquid grades of the PLURACOL E series are used to advantage as paper softeners because of their extremely low volatility. They are plasticizers and humectants. Their properties also suggest application as antisticking agents in high-gloss mineral-coated papers, and as intermediates in the preparation of long-chain fatty esters used for defoaming paper.

**PETROLEUM** — PLURACOL E derivatives are used as demulsifiers for breaking crude-oil emulsions. PLURACOL E's also serve as selective solvents in the refining process. In hydraulic brake fluids and other functional fluids, PLURACOL P polypropylene glycols impart excellent viscosity-temperature characteristics; are noncorrosive to metals, easily inhibited to prevent oxidation in formulations, and do not adversely affect rubber.

**URETHANES** — In flexible and rigid urethane foams, special urethane grades of the PLURACOL P diols and PLURACOL TP triols contribute superior properties . . . such as increased compression, deflection, higher resilience and greater strength characteristics.

If there's a place for polyglycols in your program . . . be sure to investigate Wyandotte's PLURACOLS. Write, detailing your requirements, and we'll forward appropriate samples and data for your consideration. And, we'll welcome the opportunity to work with you in exploring new applications. Get in touch with us. *Wyandotte Chemicals Corporation, Department 790-W, Wyandotte, Michigan. Offices in principal cities.*

*PLURACOL® is Wyandotte's registered trademark for its polyglycols.

**Wyandotte CHEMICALS**
**MICHIGAN ALKALI DIVISION**
*Pacing Progress with Creative Chemistry*

President Eisenhower outlined a three-point program:

(1) The State Dept. will more than double the present number of 112 commercial attaches abroad, have them develop more American export business.

(2) The Commerce Dept. will increase the number of men assigned to export promotion service, have them inform U.S. businessmen of export opportunities.

(3) The Export-Import Bank will for the first time guarantee exporters against foreign political risks on short-term export credits granted by private banks. In addition, Eximbank's credit financing in the medium-term field will be made more attractive.

The program is expected to cost $10-12 million, with only half that amount needed the first year. And, according to the President, it can be implemented without additional authority from Congress.

But so far, observers say, businessmen haven't responded too enthusiastically to the Administration's program. Some businessmen have objected to the government's techniques used in presenting its case at recent Commerce Dept. conferences. Said one Midwestern industrialist who objected to the "brainstorming" technique used at the conference, "This brainstorming act illustrates perfectly what's wrong with our exports. If we paid less attention to gimmicks and to phony advertising and more attention to producing good products that people need and want to buy at competitive prices there wouldn't be any problem."

Others objected to the proposed credit guarantee program, claiming that the Eximbank has little direct contact with the thousands of small banks across the country that would have to put up the money for an all-out export drive. These same doubters say that what is really needed is a comprehensive system of commercial credit, not just limited guarantees against political risks.

And Stefan Rundt, international business consultant for banks and numerous corporations, including a score of CPI concerns, expresses a view many in the international economic community are coming to accept. Says Rundt, "It strikes me . . . that what we really need and want, to further this country's exports, is not so much insurance coverage, unless it be as a bridging device, as it is financing facilities beyond existing ones."

It's too early to predict reactions to the Administration's program, although advance indications from Congress are favorable, and most businessmen most likely will fall in line, anxious to take advantage of any factor that will make them more competitive abroad. But, in the meantime, CPI management isn't standing still. It's making determined efforts to hold onto and to expand overseas markets in what might be this country's last big drive for exports.

## Rail vs. Barge: Act II

**By last week, two chemical process industries executives and an oil-company official had joined the railroads in their battle with waterways operators over proposed ownership of a barge line (CW, March 19, p. 35).**

International Minerals & Chemical Corp.'s Walter Norse and American Zinc, Lead & Smelting Co.'s Howard Young appeared before the Interstate Commerce Commission examiner in Washington, D.C., told the hearing that the proposed Illinois Central and Southern Pacific railroads' purchase of the John I. Hay barge company would save their concerns money.

Norse told the examiner that his company spends some $25 million annually for transportation, said this tab might drop if the railroads were allowed to buy barge lines. His reasoning: railroads might then be able to set up coordinated service, joint rates.

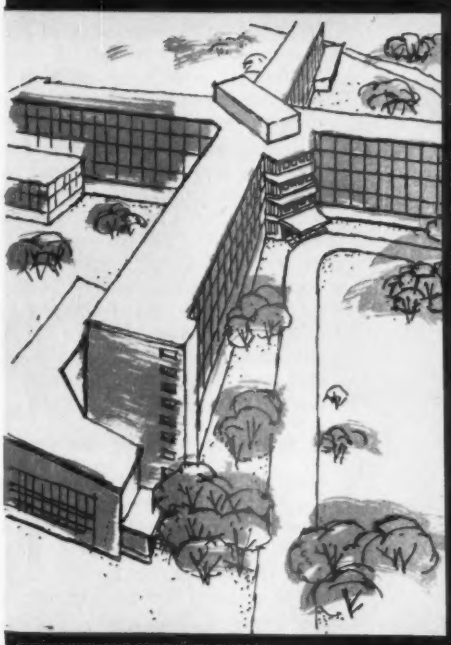
Norse also spoke about his concern for the financial plight of the country's railroads, including the Southern Pacific and Illinois Central. He explained that expansion into barge operation would strengthen the railroads.

Also supporting the railroads' application for permission to buy the Mississippi River barge line was Phillips Petroleum Co.'s assistant manager of transportation, Harold Schmidt.

So far, only the proponents of the proposed rail purchase have had their say before the examiner; opponents will have their chance later. Despite early CPI support for the measure, its a good bet that some CPI traffic men will appear before the ICC in coming months to argue against the proposed railroad purchase.

*You get more than chemicals from*

**CARBIDE**



**YOU BENEFIT FROM CONSTANT RESEARCH**

Research in synthetic organic chemicals at CARBIDE is a three-way endeavor . . . the constant search for new molecular structures that may prove commercially useful; the study of new methods to improve the purity and quality of older, well-known chemicals; and the development of new, profitable ways to use chemicals—at lower cost.

If you place a high value on new chemicals with new uses, resulting from intensive scientific research—buy your chemicals from CARBIDE. Union Carbide Chemicals Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

**UNION CARBIDE CHEMICALS COMPANY**

UNION CARBIDE

# ...AMONG SOME 3800 ORGANICS

## Made in U.S.A. under hygienic conditions

The Japanese have developed a new gravimetric reagent for potassium which we now offer as *N-(2,4-Dinitro-1-naphthyl)-benzenesulfonamide* (Eastman 7828). And regardless of how scarce are good gravimetric reagents for potassium that can be used even in the presence of one-third as much sodium and magnesium as potassium, if that numeral in front of the "naphthyl" in the name had been 2 instead of 1, we would not offer it as Eastman 7828 or Eastman anything else. Our medical director feels so strongly about the carcinogenic properties of β-naphthylamine that it would seem wiser to let the science of chemistry go shift for itself than to observe the safety precautions he demands before he will let it into the plant. Pure α-naphthylamine is OK, as far as we know.

You dissolve the new reagent in lithium chloride solution and use it for the precipitation and conductometric titration of potassium. The precipitated potassium salt of the reagent is washed with the saturated solution of potassium salt and dried at 100°C for an hour. As for the fine details of the procedure, you can either buy 10 grams of Eastman 7828 from us for $4.45 and work them out for yourself, or you can first read up on them in *Nippon Kagaku Zasshi, 79,* 598 (1958).

## A temporary tosyl with a silver handle

Chemists must now further burden their brains by learning the Purdue Reaction. Perhaps textbooks will call it the Kornblum Reaction. Whatever they call it, they've got to cover it. If the book was published prior to 1960, they had better catch it on the next edition.

The reaction converts aliphatic halides into aldehydes. The key to the reaction and to our enthusiasm is silver tosylate, which is a folksy way of pronouncing *p-Toluenesulfonic Acid Silver Salt* (Eastman 7912). It reacts with a primary aliphatic halide to give silver halide and the aliphatic tosylate. The latter is then added to a suspension of sodium bicarbonate in methyl sulfoxide at 150°C. In three minutes the temporary tosyl is all stripped off, and what started as

$$CH_3(CH_2)_nCl$$

has all changed to

$$CH_3(CH_2)_{n-1}CHO.$$

This was one time we didn't wait to be asked. As soon as we read of the reaction, we steamed ahead to put silver tosylate on the market.

Because of the nature of our father's business, whenever there is anything going on involving the chemistry of silver, nothing will do but what we must get into the thick of it. Another ace we hold is the knack of brewing a really good p-toluenesulfonic acid, which is not as common as you might think.

As a matter of fact, we can afford the candor of admitting that the preparation of *p-Toluenesulfonic Acid Silver Salt* was an easy one. And yet, if you duplicated our method in every detail, you would find you had wasted money by not buying it from us at $4.15 for 25 grams. Could it be that our time isn't worth as much as your time? No.

## Man passing out dotriacontane

We have a yarn that ties in the sperm whale with relativity. It has a moral but lacks a punchy climax.

On the theory that not only is the grass greener on the other fellow's lawn but he also leads a more interesting life, we would tell the organic chemists how the atomic physicists are looking for substances against which polarized free electrons can bounce without having their spins inverted. The physicists want to coat a substance like that on the walls of evacuated glass vessels. It should have no free or unpaired electrons, no crystal structure. To an electron scooting by, such a molecule should appear magnetically inert. The small residual pressure tolerable in the vessel should be mostly of rubidium vapor and not of the non-inverting substance. Also the coating must have good transmittance at around the 8000A wavelength of the radiation fed to excite the rubidium.

"Optical pumping," the theme these experiments share, has to do with the manipulation of quantum levels so that emission from the excited alkali metal atoms can be tuned with great elegance. Pressure to improve understanding of the phenomena comes from the need for instrumentation to study the Van Allen radiation belts and for satellite-borne atomic clocks to check out Einstein's old predictions about the meaning of time as told from a moving timepiece.

On the same greener grass theory, the yarn as spun for atomic physicists would focus on some little samples of non-inverting substance that were passed out at a recent optical pumping conference by a man who may well have bought the material from us as *Dotriacontane* (Eastman 3555). Now the sperm whale enters. Spermacetti wax once had a role in physics as the material of the standard candle which defined candlepower. When chemists attacked it, they found cetyl palmitate, $C_{16}H_{33}OCOC_{15}H_{31}$. We have to make a long, uniform, inert, homogeneous molecule out of that. First we snap off the $-OCOC_{15}H_{31}$ and replace it with bromine. Then, making use of a thought that occurred to Adolphe Wurtz around 1855, we react the cetyl bromide [which we call *1-Bromohexadecane* (Eastman 3375)] with sodium.

$$C_{16}H_{33}\boxed{Br + 2Na + Br}H_{33}C_{16} \rightarrow$$

$$C_{32}H_{66} + 2NaBr$$

In effect, the two oxygens the whale put in the middle of the molecule have been replaced by hydrogens. That is *Dotriacontane.*

The climax, if any, will come when word filters through that *Dotriacontane* has done the job.

The moral is that with some 3800 compounds to milk, one need never be at a loss for words.

Would you have use for a book entitled "Eastman Organic Chemicals Classified by Functional Groups?" If so, or for the even worthier purpose of placing an order for one or more of those 3800 or so Eastman Organic Chemicals that are available by virtually a snap of the fingers, communicate with *Distillation Products Industries,* Eastman Organic Chemicals Department, Rochester 3, N. Y.

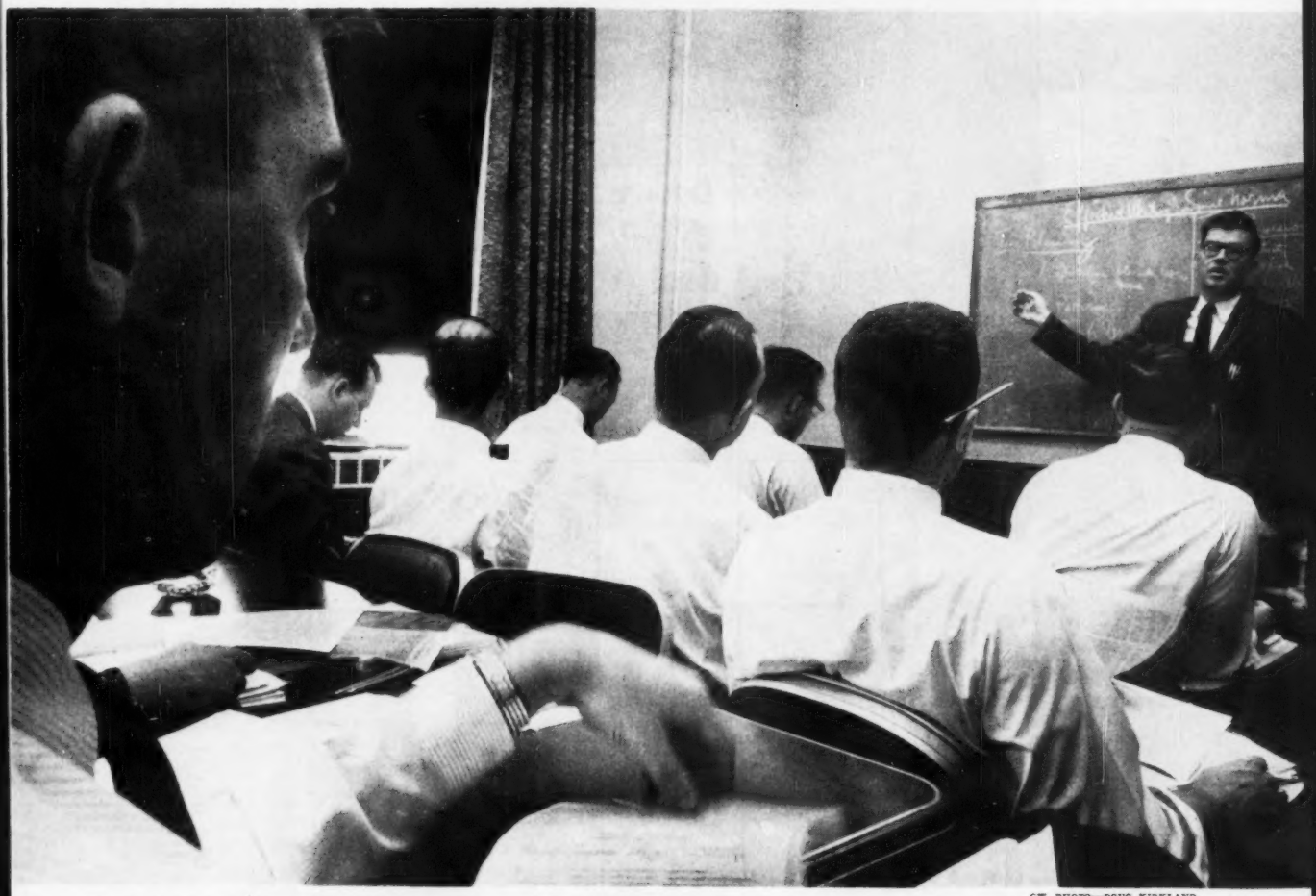
*Prices are subject to change without notice.*

DPi

**Eastman Organic Chemicals**

**Also . . . vitamins A and E in bulk . . . distilled monoglycerides**

**Distillation Products Industries** *is a division of* **Eastman Kodak Company**



CW PHOTO—DOUG KIRKLAND

**Shell Chemical Corp.'s writing course teaches researchers how to turn out more lucid reports.**

# Prose-Polishing Betters Research's 'Product'

**A determination to work greater clarity and understandability into research reports is opening a new phase of research management. In upgrading what has been called the sole "product" of research, there's gain for both company and individual. But the teaching of effective report writing (above) varies greatly. Here's a rundown of how U.S. companies are tackling the job.**

The class pictured here is engaged in one of the in-plant sessions given at Shell Chemical Corp.'s Union, N.J., labs by James Greene, of nearby Union Junior College Institute (Cranford, N.J.). This is a system enjoying considerable favor in the East now. Greene has other courses going at the New Jersey labs of Ciba Pharmaceutical Products, Inc. (Summit), Union Carbide Plastics Co. (Bound Brook) and Merck & Co. (Rahway).

But many other companies also offering their researchers training in good report writing, are using somewhat different plans. Among favored systems: courses given by trained writers within the company, individual advice and editing help from trained insiders, classes and panels outside the firm, and written material (e.g., manuals, books, outlines). Other companies shy away from a formalized approach, tend to leave advice on writing improvement up to supervisors. Only a few concerns go to the other extreme, hiring full-time people to help write reports (*CW, Jan. 2, p. 53*).

**Only Product:** Farris Swackhamer, director of the Shell lab, pinpoints the importance of good writing to both the labs and the individual researchers: "Reports are the only product we turn out." He adds that lack of ability with the English language among researchers is one of the most pressing problems at Shell's laboratory.

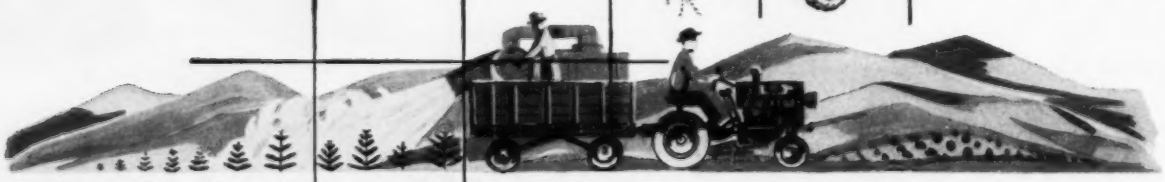
Other companies feel that problem, too. One says bluntly, "researchers who can't write don't get promoted very far."

Although Shell's 10-week series of two-hour classes has been under way only seven weeks, Swackhamer has already noted improvement in the re-

SULPHUR

ONE OF THE FOUR STRONG PILLARS OF PROCESSING

...BUT WHAT A 2% !



**A recently compiled breakdown of Sulphur consumption in the United States, shows about 2% of the Sulphur goes into the manufacture of insecticides and fungicides.**

Not much, perhaps, as tonnages go but no other use of Sulphur is more important with the possible exception of the 'wonder' drugs. It doesn't take much imagination to picture what would happen if the bugs and parasites were allowed to take over our crops and trees. Sulphur, along with other chemicals, is helping to protect our food supplies and foliage.

The role that TGS is playing in this constant fight against crop destruction is to see to it that the manufacturers of the insecticides and fungicides *always* have a ready supply of Sulphur, both solid and molten. This constant production and centralized distribution coupled with technical help is our contribution to industry.

SULPHUR PRODUCING UNITS

• Newgulf, Texas • Spindletop, Texas
• Moss Bluff, Texas • Fannett, Texas
• Worland, Wyoming
• Okotoks, Alberta, Canada

**TEXAS GULF SULPHUR CO.**

75 East 45th Street, New York 17, N.Y.
811 Rusk Avenue, Houston 2, Texas

ports that cross his desk. One of the most helpful improvements: shorter, more readable sentences.

Plans are already in the works for a second course, since only about 20 staffers can be handled at one time. Cost, about $50/man, includes four personal conferences in addition to the 20 hours of instruction.

**Course Choice:** Most firms contacted by CHEMICAL WEEK say they're concerned about the problem, and that, to tackle it, a number of plans are available. Both private consultants and university instructors are available to give courses. Robert Gunning of Robert Gunning Associates (Blacklick, O.), consulting firm, has given lecture series at a number of CPI firms, including Abbott Laboratories (North Chicago) and Standard Oil Co. of Indiana (Whiting).

Continental Oil Co. (Houston) also calls in outside specialists. Every two or three years, it brings in an expert to conduct a six- to 12-day course, which costs the company up to $2,500.

Armour Research Foundation (Chicago) uses both outside help and its own staffers in its program. (It holds annual seminars for researchers who have specific writing problems or who are being promoted to positions that demand augmented writing skill.) Its course runs eight weeks, is staffed by representatives from industry and colleges as well as by ARF personnel.

**Inside Experts:** Companies with trained writers and more formalized programs often use the people to instruct other staffers. Humble Oil & Refining Co. (Houston), for instance, has run its own technical report-writing program since '49. Each class of 12-15 employees attends four two-hour meetings, submits three reports for criticism during the course.

Another large petroleum company is currently conducting a letter-writing course, which will be expanded later into a report-writing program. New employees in the technical employee orientation program are urged to seek advice in writing; the letter-writing course and the proposed report-writing course are intended to make such help more readily available.

Ethyl Corp. also has run its own writing courses, both at Detroit and Baton Rouge. These courses run 15-20 hours, are intended primarily for new researchers, although supervisors have also been able to take advantage of them.

**Ready with Advice:** "Captive" consultants are also valuable as resource personnel for researchers that need advice on either general techniques or questions about a specific report. Indiana Standard has a publication committee that reviews all R&D manuscripts aimed at outside publication and also advises on internal reports, when requested. In addition to technical content, the committee reviews organization of material, clearness and conciseness of writing.

This careful screening of manuscripts is not always welcomed by authors. As James Howe, secretary of the committee, puts it: "Most authors come out of our sessions boiling mad; but after a little time has past and their hackles have gone down, they realize that we've helped them."

Armour Research Foundation, one of the few organizations with full-time editors on its staff, uses them to advise authors as well as to edit reports. These editors generally consult with the researcher after his first draft is finished. Where the meaning is definitely obscured, they offer pointers, but do not force the use of any arbitrary style.

**On the Road:** Clues to better writing can also be found at various locations outside the company. For instance, Massachusetts Institute of Technology runs a week-long summer course on technical report writing. It's conducted by associate professor of English Robert Rathbone, who is a frequent visiting lecturer for industry.

Most companies consider outside writing courses valuable to the professional development of the researchers, offer the same financial assistance for these courses as for technical ones. Jefferson Chemical (Houston) sponsors a man each year at one such course, offered by the American Management Assn.

Researchers at one company, which doesn't finance outside writing courses, are urged to take advantage of report-writing presentations offered by professional societies.

**By the Manual:** To achieve some degree of uniformity in reports, a number of companies publish manuals that spell out preferred methods



*You get more than chemicals from*

**CARBIDE**

**ECONOMICAL SHIPPING METHODS**

The synthetic organic chemicals you require in quantities for volume production can be obtained economically from CARBIDE. Tank car, tank truck, barge, or tanker orders are shipped from the CARBIDE plant or bulk station nearest you. Combination orders of two or more chemicals can be shipped in *compartment* tank cars or *compartment* tank trucks at substantial savings. You also save when you order several chemicals in drums to make a full car or truck load.

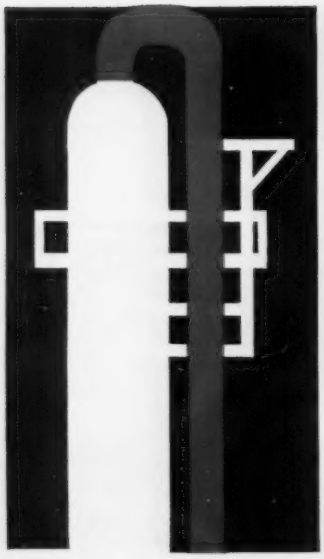
To receive your chemical shipments fast, taking full advantage of combination shipments, why not place your next order with us. Union Carbide Chemicals Company, Division of Union Carbide Corporation, 30 East 42nd St., New York 17, N. Y.

**UNION CARBIDE CHEMICALS COMPANY**

UNION CARBIDE

# IBM 1620 *data processing system*

## ...the most powerful engineering computer in its low price class



**In the Chemical Industry the IBM 1620 solves problems like these:**

- *statistical design of experiments*
- *reactor design*
- *mass spectrometry*
- *kinetics*

The new IBM 1620 is a desk-size engineering computer that offers you more computing ability per dollar than any system in its price class.

Transistorized throughout, the IBM 1620 has a 20,000-digit magnetic core memory with variable field length and immediate accessibility. Its input-output notation, on paper tape and console typewriter, is in convenient decimal arithmetic. It can perform more than 100,000 calculations a minute and is easily adapted to your engineering problems.

Easy to learn, easy to operate, easy to communicate with, the low-cost 1620 helps free your engineering talent for more creative work. And in keeping with our concept of Balanced Data Processing, the IBM 1620 is supported by extensive services. This includes a comprehensive library of mathematical routines and specific industry programs to permit you to put the 1620 to work without unnecessary delay.

Ask your IBM representative about the unique advantages of the IBM 1620. Like all IBM equipment, it may be purchased or leased.

**IBM** *balanced data processing*

of organizing and writing reports. Armour has a detailed, 45-page book that covers the writing up of minutes and proposals as well as reports.

Abbott Labs uses a pocket-size booklet prepared for the firm by Robert Gunning, based on his six-lecture series presented there in '58. Celanese Corp. of America (New York) and C. F. Braun & Co. (Alhambra, Calif.) are among the other companies that have extensive companywide publications on how to write better.

**Informal Approach:** Rather than become involved in any kind of organized effort, many companies prefer to use an informal approach to upgrading the writing of its researchers. One lab director, for instance, believes that most writing programs are overdone. He says that a researcher can write a good report if he has only a grasp of a few basic principles.

Majority opinion, however, is that a lot of work is required to drive these few basic principles home to many researchers.

Another company is admittedly so awed by the task of changing a man's writing habits that it provides only a suggested outline for reports.

Most companies without formal programs place the responsibility for well-written reports on supervisors. But whether supervisors are responsible for the literary training of employees under their direction or whether they do all the rewriting themselves, they obviously must have writing skill themselves. And an increasing percentage of companies are doing their best to help out those who have the ability but haven't had a chance to develop it.

## EXPANSION

• Chemical Process Co., manufacturer of resins, plastics and adhesives, is doubling the floor space of its research laboratory in Redwood City, Calif. Completion of the $100,000 expansion is slated for mid-June.

• A new, $4.8-million metallurgy and ceramic building will be built at the Metallurgy Division of Oak Ridge National Laboratory (Oak Ridge, Tenn.), operated by Union Carbide Corp. for the U.S. Atomic Energy Commission.

• The International Wool Development Co. (London, England) will begin operations about July 1. It's a nonprofit research organization planning to serve all sections of the wool industry in the U.S. and abroad.

• Bendix Aviation Corp.'s Kansas City division (Kansas City, Mo.) has completed a polymer chemistry and engineering building for plastics studies.

• National Research Corp. (Cambridge, Mass.) has established a Space Vacuum Laboratory equipped to match pressures equivalent to altitudes in excess of 400 miles. It's for research on space vehicle materials, components and devices.

• General Electric Co., a corporate member of the International Science Foundation, has received an option on about 6 acres of land in the International Science Center (Sunny Vale, Calif.) for a computer laboratory.

• Ferro Corp. (Cleveland) has launched a $225,000 expansion of its Research Center facilities.

• Chemical Information Service, Literature Division of Fabian Chemical Co. (4370 Clark St., Montreal 18, Canada) is a new organization offering "sources, prices and technical data on all chemical compounds." Cost: $2.50 per compound inquiry; five at $2 each; 25 at $1.75 each.

• Pennsalt Chemicals Corp. (Philadelphia, Pa.) has formed a Research Products Development Dept. as part of its Technical Division. Primary objectives: determination of commercial potentials of Pennsalt's polyvinylidene fluoride resin, RC-2525; high-energy perchloryl fluoride; and the company's new trifluoroethyl intermediates and aerosols.

• Princeton Chemicals Research, Inc. (Princeton, N.J.) is a new contract research and development organization specializing in petrochemicals, polyolefins and catalysis.

• Electro-Optical Systems, Inc. (Pasadena, Calif.) has completed a new $1-million laboratory to house work on an ion propulsion engine for space vehicles and satellite control mechanisms. Other programs include work on molecular electronics, solid state transducers.

• National Aeronautics and Space Administration is building a new, $400,000 laboratory at Greenbelt, Md., for testing space devices and materials.



*You get more than chemicals from*

**CARBIDE**

**BASIC MATERIALS YOU CAN USE FOR BETTER, MORE USEFUL PRODUCTS**

Here are some of the broad groups of chemicals available *now* from CARBIDE:

- Acrylates • Alcohols • Aldehydes
- Acids • Anhydrides • Aryl Compounds • Chlorine Compounds
- UNOX Epoxides • Esters • Ethers & Oxides • UCON Fluids & Lubricants
- Glycol-Ethers • Glycols & Triols
- Ketones • Metallic Salts
- Monomers • Nitrogen Compounds
- FLEXOL Plasticizers • NIAX Polyethers
- CARBOWAX Polyethylene Glycols
- Polypropylene Glycols
- UCON Propellants and Refrigerants
- Special-Purpose Chemicals
- TERGITOL Surface Active Agents
- POLYOX Water-Soluble Resins

Nearly 400 synthetic chemicals of outstanding quality are offered by CARBIDE. Most are available in quantities for high-volume production—and prices are competitive. For a more complete listing, mail the coupon to Dept. J, Union Carbide Chemicals Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

CARBOWAX, FLEXOL, NIAX, POLYOX, TERGITOL, UCON, UNOX, and UNION CARBIDE are registered trade marks.

**UNION CARBIDE CHEMICALS COMPANY**

UNION CARBIDE

**Union Carbide Chemicals Company**
Department J
30 East 42nd Street, New York 17, N. Y.

Please send me a copy of "Physical Properties of Synthetic Organic Chemicals," 1960 edition, listing nearly 400 CARBIDE chemicals.

Name_____

Position_____

Company_____

Street_____

City_____ Zone____ State_____

**Judges Larson and Moule give supermarts new chance at drugs.**

# Drugmakers in the Middle

**Two recent court decisions, one in Minnesota and one in New York, have loosened some local restrictions on drug sales, and brought the pharmaceutical industry closer to a long-needed legal definition of "proprietary drugs." But the rulings pose a problem for drugmakers: they stand to gain by having new outlets—but can't alienate their primary dealers, the drugstores.**

Both suits were brought by supermarket grocery chains. These stores want to sell certain drugs without getting special licenses; since the licenses are required for all but "proprietary drugs," the crux is in what is meant by the term "proprietary." And in both cases, although the judges stepped near a definition, they settled their issues by terming them special situations.

Until the decisions have been tested —and because they are somewhat limited in scope—drugmakers are chary about commenting. But one company did tell CHEMICAL WEEK: "These (decisions) may well knock the props out from under pharmacists' argument for restricted sales. . . ."

**In New York:** The very similar decisions, based on what constitutes "proprietary" drugs and other related problems that bear on the question of nondrug outlet sales, were reached almost simultaneously.

In Buffalo, N.Y., State Supreme Court Justice Reid S. Moule told Loblaw, Inc., food-store chain, it can sell Bayer aspirin in its supermarkets. He ruled that aspirin tablets can differ from one another, despite the generalities of minimum statutory definitions, and that "secret processes," product claims and the Bayer brand-name constitute a proprietary interest. The judge found that since aspirin, properly taken, is noninjurious, there is no question of public health involved in supermarket distribution.

Since the majority of Bayer tablets are sold elsewhere than in drugstores in other states, the judge found no grounds for licensing "legislation [that would give] drugstores a monopoly on economic grounds in the retail sales." Judge Moule, however, made no attempt to define "proprietary drugs" as such, believing that under present statutes each drug's type must be determined individually.

New York's board of regents and board of pharmacy—which have jurisdiction over licensing drug sales—have not announced whether or not they intend to appeal the decision.

**In Minnesota:** In a decision allowing 12 proprietary drugs—Alka-Seltzer, Anacin, Bromo-Seltzer, Bufferin, Feen-A-Mint, Fletcher's Castoria, Sal-Hepatica, Pinex, Va-Tro-Nol, Murine and Ex-Lax—to be sold in the Red Owl chain of supermarkets, County Judge William C. Larson also did not attempt to define proprietary drugs.

He did, however, observe that the manufacturer of each of the products "has an exclusive proprietary right in the tradename, in the formula which constitutes a trade secret, in the ingredients . . . methods of compounding . . . experience, research and advertising through which each manufacturer has created common acceptance of the tradenamed product as a household word throughout the nation; that each product is the exclusive property of the manufacturer concerned."

**In Washington:** At the federal level, the Food & Drug Administration has taken no official position on sale of nonprescription drugs—whatever the outlet. Retail druggists, however, have long tried to get the agency to endorse the idea that drugstores should have a monopoly on the sale of drugs, prescription or otherwise.

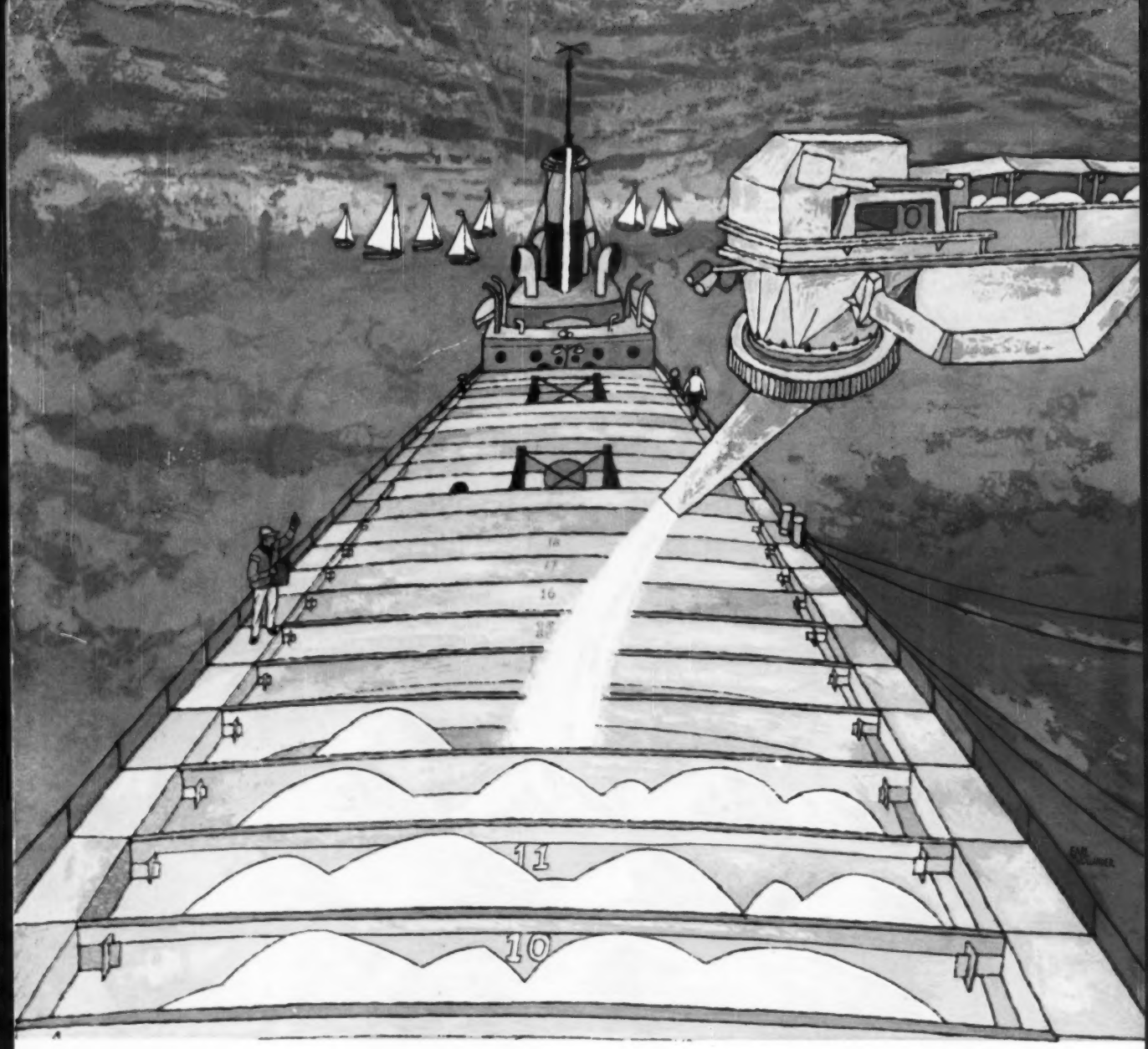
FDA officials are of two minds on the issue, privately. In theory, they would like to see any situation that improves the lot of the prescription-filling druggist, who is licensed by the state to have charge of the drugs in his community. On the other hand, they say drugstores have weakened their own position by going into the fields of other merchandisers.

Like FDA, drugmakers are pulled between two interests. Some tell CHEMICAL WEEK they have been fighting the restrictive legislation. Others praise the new decisions, but doubt if they will be upheld on appeal. There have been several cases where lower court decisions have been overturned because of "legal technicalities."

Minnesota, in particular, has earned the reputation of being a "hotbed of restrictive sales." Until the latest Minnesota decision has weathered the almost-certain appeal, drugmakers will do little to promote grocery and supermarket outlets for their products.

## LEGAL

**Additives Control:** A New York state legislative committee held a one-day public hearing last week on proposed legislation to revise state standards for food processing. Several industries fear the new rules might




# Only Morton offers salt service to industry everywhere in America

Six thousand tons of rock salt are conveyed aboard a ship anchored at a Morton plant in the Midwest. This salt will be delivered for such uses as ice and snow removal, hide curing and chemical making.

In addition to rock salt from mines, Morton also produces a wide variety of high grades of evaporated salt from wells and solar ponds located coast to coast. With two or more sources for any grade of salt you might need, Morton is equipped to make delivery from alternate plants, even under adverse conditions that might otherwise endanger the continuous operation of your plant.

As the only nationwide salt company, Morton can offer you expert, impartial advice on which of 100 different grades of salt will do the best job for you. Morton also offers the fastest, most economical delivery on a bag to thousands of tons of salt anywhere in the country.

What's more, Morton backs its salesmen with the services of the most complete salt research laboratory in the world. Any salt problem your Morton Saltman personally can't solve can be referred to Morton's ultra-modern laboratory for quick, thorough analysis. This technical help alone can be worth thousands of dollars to you every year.

▲ *Salt Sources* ● *Sales Offices* ■ *Warehouses*

**MORTONSALT**
**COMPANY**
INDUSTRIAL DIVISION

*110 N. Wacker Drive, Chicago 6, Illinois, Tel.: Financial 6-1300*

APPLIED COLOR

# Labels that last as long as the glass



Call the Owens-Illinois office nearest you for full information

LETTERING

DURAGLAS CONTAINERS
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO
PACIFIC COAST HEADQUARTERS • SAN FRANCISCO

Photomicrograph of an air bubble entrapped in a lacquer film on mahogany panel.

# Portrait of a problem . . .

Problems abound at every step in surface coating formulation and application. This portrait of a tiny blister represents only one of many challenges Shell Chemical technicians encounter in their continuing program of practical and theoretical research.

Shell's high quality ketones, alcohols, and intermediates, coupled with technical assistance to surface-coating formulators, lead to products of superior performance and greater economy. Use of the chemicals listed at the right can help you improve your line of products.

* * *

Why not become better acquainted with the many chemicals and services that are available to you through Shell Chemical? Write or phone your nearest district office for information concerning your special field of interest.

Acetone
Diacetone Alcohol
Di-Tertiary Butyl Peroxide
Ethyl Alcohol
Ethyl Amyl Ketone
Glycerine
Hexylene Glycol
Isopropyl Alcohol
Mesityl Oxide
Methyl Ethyl Ketone
Methyl Isobutyl Carbinol
Methyl Isobutyl Ketone
Neosol® Proprietary Solvent
p-Tertiary Butyl Benzoic Acid
Secondary Butyl Alcohol

SHELL

**SHELL CHEMICAL COMPANY**
**INDUSTRIAL CHEMICALS DIVISION**

Atlanta • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver

differ seriously from federal standards. According to one food processor at the hearing, state controls—if they conflict with present federal law—would create "a most chaotic situation."

The manufacturers' representatives pointed to the high cost of duplicating tests and reports if there were two sets of standards, and said that present state laws were adequate and should not be changed. The committee chairman told the representatives he believed it wasn't necessary to have "two systems, provided the federal standards are high enough."

•

**Fire Suit:** Eastern States Petroleum and Chemical Co. (Houston, Tex.) is facing a $90,000 lawsuit filed by four firemen who were burned while fighting a fire in the company's plant last February. The suit charges that the company failed to close a valve that controlled the flow of propane into tanks. They allege that while they were spraying one tank to prevent spread of the fire, a second tank ignited and burned them.

## LABOR

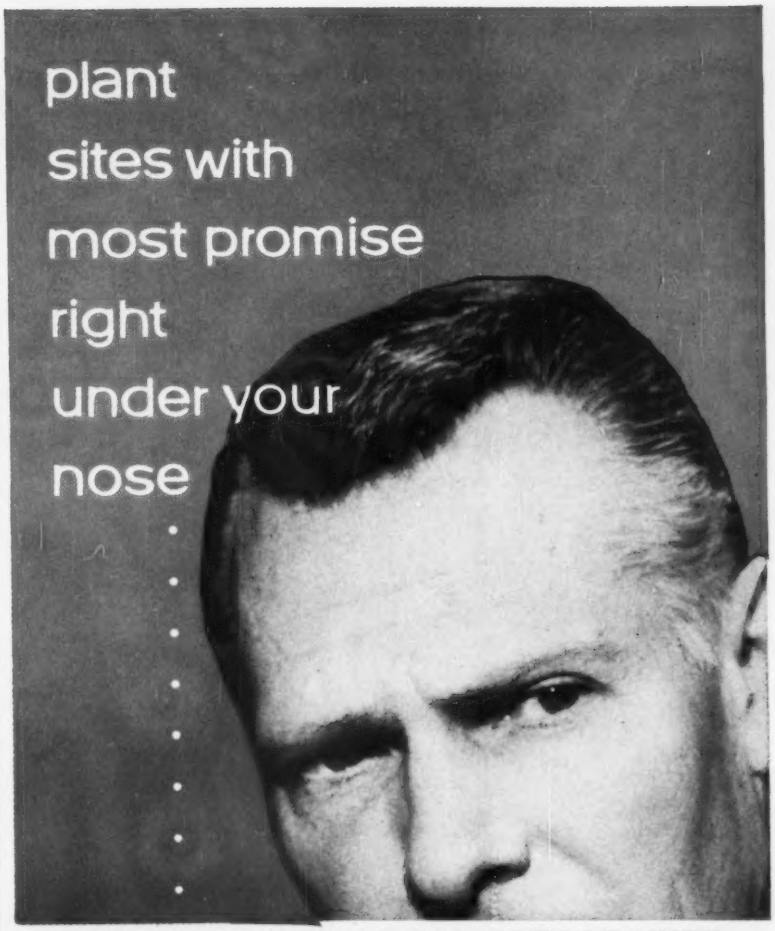
**Teamsters Push:** The International Teamsters Union is trying to organize employees of the Virginia-Carolina Chemical Corp.'s phosphate works near Nichols, Fla. Employees, currently represented by International Chemical Workers Union, have been without a union contract for seven months, following their resumption of work after a bitter, but inconclusive, strike.

The Teamsters Southern Conference has petitioned the National Labor Relations Board to set an election date. The Teamsters have estimated that 600 employees are eligible to vote and that only about 200 remain in ICWU Local 36.

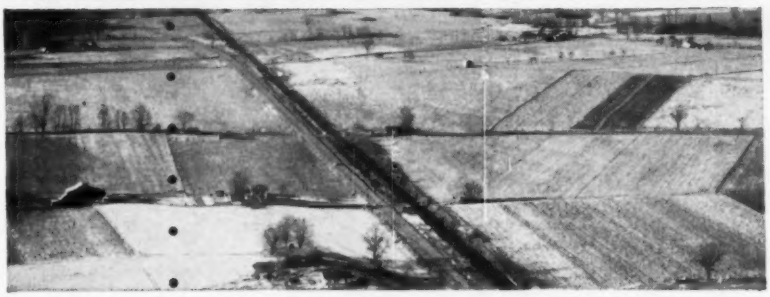
Local observers expect ICWU to ask the NLRB for permission to have its name on the ballot. This is the tactic that resulted in reaffirming ICWU's recognition at the Bonnie plant of the International Minerals & Chemical Corp. when the Teamsters tried to organize it last year.

•

**Allied Settlement:** Employees and management at Allied Chemical's National Aniline Div. plant at Hopewell, Va., have completed wage-reopening


IN THE B&O LAND OF BIG OPPORTUNITY...



● *Take a close look*...at sites nearer *more people ... more customers ... more workers ... more industry ... more resources ... more power ... more superior transportation.* Join the Nation's blue-chip industries in the B&O area!

*Plan with a B&O man!*

PHONE OR WRITE:

*T. G. Gordon, Industrial Agent*
BALTIMORE 1 LExington 9-0400

*G. E. FERENCE, Ind. Development Agt.*
NEW YORK 4 DIgby 4-1600

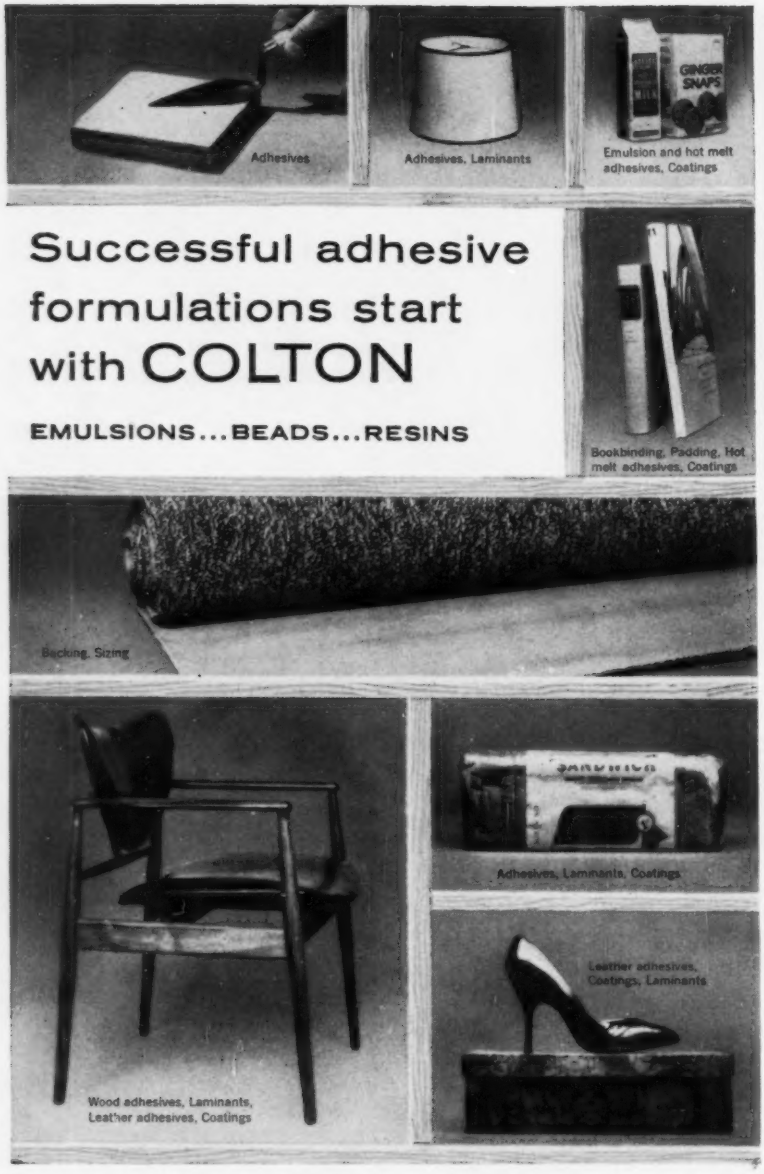
*A. C. TODD, Industrial Agent*
CINCINNATI 2 DUnbar 1-2900

*FIELDING H. LEWIS, Industrial Agent*
PITTSBURGH 22 COurt 1-6220

*W. E. OLIVER, Industrial Agent*
CHICAGO 7 WAbash 2-2211

B&O

Baltimore & Ohio Railroad
Constantly doing things—better!




The right adhesive helps any product on the road to market success . . . and for adhesive manufacturers success can start with Colton emulsions, beads, and resins.

Colton offers a wide range of products, each available in a variety of grades, each tailored to meet specific formulation requirements. Colton supplies resins for adhesive compounding . . . not finished adhesives.

Vinac (polyvinyl acetate homopolymer emulsions, beads and spray dried powder), Flexbond (copolymer emulsions and beads), and Vinol (polyvinyl alcohol) give formulators a choice of starting points for adhesives to suit specific end-uses. By starting with Vinac, Flexbond, or Vinol products you eliminate guesswork and needless production worry because Colton polymers meet high specifications. Colton starts with high quality monomers . . . production is controlled and strengthened every step of the way by Colton's years of knowledge and continuous research . . . and backing up the skills of Colton Chemical Company, a division of Air Reduction Co., Incorporated, are the basic research resources of Airco's Central Research Laboratories at Murray Hill, New Jersey.

**COLTON CHEMICAL COMPANY**

A Division of Air Reduction Company, Incorporated • 1747 Chester Avenue, Cleveland 14, Ohio

Sales Offices and Warehouse Facilities Throughout U. S. Export: Airco Company International, New York 17, N. Y.

*AT THE FRONTIERS OF PROGRESS YOU'LL FIND...AN AIR REDUCTION PRODUCT*

## ADMINISTRATION

negotiations with a settlement that calls for a 4% general wage increase —averaging 9¢/hour—with adjustments in some rates among production and laboratory workers. In addition disability insurance benefits were raised from $50 to $55/week. The production and maintenance employees are represented by Local 13942, United Mine Workers. The two-year contract under which the negotiations took place expires in March, '61.

•

**Reichhold Turndown:** At its Hampton, S.C., formaldehyde plant, 17 Reichhold Chemicals employees turned down bids for representation by the Teamsters Union, the Union of Operating Engineers and the International Chemical Workers Union in an election ordered by NLRB.

## KEY CHANGES

**David L. Eynon, Jr.,** to chairman, board of directors, **John A. Scott** to president and board of directors, **C. W. Hardell** and **Carl H. Pottenger** to vice-presidents, **R. E. Howe, E. J. Anglin, W. P. Arnold** and **J. M. Veeder** to board of directors, newly formed Sinclair-Koppers Chemical Co., jointly owned petrochemical subsidiary, Sinclair Oil Corp. and Koppers Co., Inc. (Pittsburgh).

**Frederick B. Adams** to board of directors, American Potash and Chemical Corp. (San Francisco).

**David J. Fitzgibbons** to vice-president, Sterling Drug, Inc. (New York).

**William H. VanBeck** to vice-president, Nitrogen Division, Allied Chemical Corp. (New York).

**George S. Vermilyea** to president, **Vernon M. Setterholm** to vice-president, Nems-Clarke Co. and **W. G. Shaffer** to director of Silver Spring Laboratory of parent company, Vitro Corp. of America (New York).

**John F. Kirck** to executive vice-president, **B. H. Lorant** to vice-president, research, and board of directors, and **A. B. Chadwick** to vice-president, manufacturing and engineering, Velsicol Chemical Corp.

**W. R. McLellan** to vice-president, operations, Food Machinery and Chemical International, division of Food Machinery and Chemical Corp. (San Jose, Calif.).

# ENJAY DELIVERS 1,000,000th LONG TON OF BUTYL!

## PRODUCTION FACILITIES INCREASED TO MEET CONSTANTLY GROWING DEMAND

There have been many elastomers developed since the first commercial ton of Butyl was used in 1943, but no other rubber, synthetic or natural, offers so many outstanding properties for so many applications.

Plant expansion plans announced recently will increase butyl production capacity some 50 percent by 1961 and, at today's rate of consumption, the two million-ton mark will be reached within the next six or seven years. Two new additions to the butyl product line, Chlorobutyl and Butyl Latex, will soon be available in commercial quantities.

VERSATILE ENJAY BUTYL'S OUTSTANDING PROPERTIES MAKE IT SUPERIOR TO OTHER RUBBERS FOR MANY APPLICATIONS. SOME ADVANTAGES:

- **RESISTS TEAR AND ABRASION** ... used in the new and revolutionary all-butyl tire.
- **STANDS UP AT HIGH TEMPERATURE** ... used in steam hose and tire curing bladders
- **HAS EXCELLENT ELECTRICAL PROPERTIES** ... used in high voltage cable insulation
- **IS IMPERMEABLE TO GASES** ... used in virtually all rubber air-holding applications
- **HAS WIDE RANGE OF DYNAMIC PROPERTIES** ... used in over 100 applications on the modern automobile
- **DISPLAYS OUTSTANDING CHEMICAL RESISTANCE** ... used for the storage and shipment of many chemical and commodity products
- **WITHSTANDS EXPOSURE TO SUN AND WEATHER** ... used in irrigation pipe and roof coatings.

*Want to find out fast, how versatile Butyl can improve your product? Call or write the nearest Enjay office.*

EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY

ENJAY COMPANY, INC.

*15 West 51st Street, New York 19, N.Y.*

*Akron • Boston • Charlotte • Chicago • Detroit • Los Angeles • New Orleans • Tulsa • Toronto*

ENJAY® BUTYL

At every stage of textile processing, Nopco products perform an essential function. Nopco textile lubricants and antistatic agents are geared to modern high-speed textile machinery. Scouring and finishing chemicals are available for the processing of all fibers. And Nopco provides essential chemicals for other industries, too . . . leather, paper, food, plastics, to mention only a few. For a skilled hand in practical chemistry, look to Nopco.

For complete information see Chemical Materials Catalog, pages 212-213.

*A skilled hand in chemistry . . . at work for you*

Lubricants
Detergents
Plasticizers
Softeners
Emulsifiers
Dispersants
Wetting Agents
Defoamers
Stabilizers
Metallic Soaps
Enzymes
Thickeners
Vitamins
Foamed Plastics

# NOPCO®

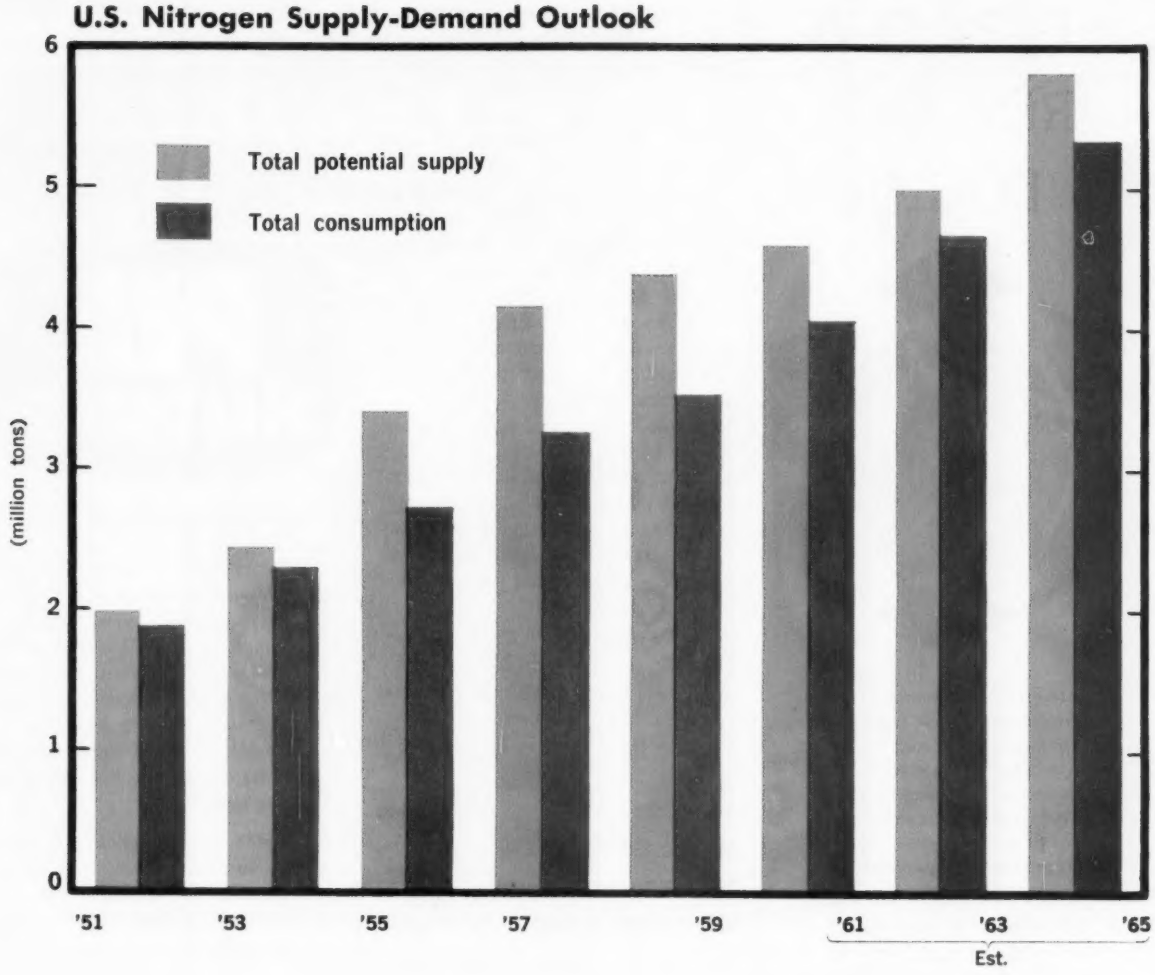
*helps textile yarns run smoothly*

NOPCO®

**NOPCO CHEMICAL COMPANY**

60 Park Place, Newark, N.J.

Harrison, N.J. • Richmond, Calif.
Cedartown, Ga. • Boston, Mass.
Chicago, Ill. • London, Canada




# Farm Forecast: Fair Weather for Ammonia

**U.S. ammonia marketers—along with the nation's farmers—are watching weather maps for the signs of springtime that will permit them to start their sales campaigns. Despite the aggravating delay, ammonia consumption on the farm is expected to hit a new high this year, once selling gets under way. In fact, use of ammonia will probably again outpace—as it did in '59—growth of total fertilizer consumption.**

This bright outlook is based on a quick break in the weather. Producers of phosphate and nitrogen fertilizers in the Intermountain area, for example, are far from cheerful "because sales are off 75-80% in areas west of the Mississippi, compared with sales this time a year ago." There's a distinct fear that what might have been a good year may yet turn out to be a dud.

Continuing emphasis on use of nitrogen—especially in the form of ammonia—will be necessary if ammonia markets are to grow in the next five years. And if future success matches that of the recent past, best bets now are that more than 90% of current U.S. synthetic ammonia capacity will be in use by '62. (Admittedly, there are hard-to-predict factors—such as weather—that could alter the picture.)

This leads industry experts to predict that by '62 earnings will be up (helped by higher prices); that imports will be encouraged, exports discouraged; that there will be renewed interest in capacity expansion in '62, followed by another likely expansion round in '65.

Most important, the industry probably learned its lesson well, after wallowing for a decade in an unprecedented ammonia glut; forthcoming expansions will almost surely be better keyed to realistic appraisals of the nation's needs.

Most market forecasts are based on assumption of some sort of "optimum" market conditions. For example, one recent nitrogen forecast

GET
THE MOST
FOR YOUR
RESEARCH
DOLLAR

Marco Development offers a performance-proven method for lowering research investment costs. A generation of experience in continuous processing technology is brought to you in Marco manufactured research and production equipment.

The Marco multiple experimenter for example can become your complete research center for processing studies of chemicals, rubber, plastics, fiber, soap, and detergents.

Marco experience is also available through research and development services. Use jointly our experience and the know-how of your own staff to achieve research goals that can become commercial realities.

Write for detailed literature today. Learn how you can get increased production in continuous process equipment with a lower capital investment.

**MARCO**
**DEVELOPMENT CO., INC.**
P.O. BOX 325 WILMINGTON 99, DEL.



by market analysts of Southern Nitrogen Co. is predicated on the assumption that nitrogen producers (predominantly ammonia marketers) will grab every opportunity to strengthen their market development programs.

For Southern Nitrogen, this means county-by-county programs throughout its marketing area, says George Taylor, SN's vice-president of sales. He points out that intense promotional work—controlled through the office of the Agricultural Extension Agent and supported by the fertilizer industry—boosted agricultural nitrogen use in eight counties of Georgia by 45.1% in '58 (compared with '57) while demand in the rest of Georgia increased 24.8%. Over the entire U.S., the increase was only 4.2%.

Result of a broad-scale program, Taylor figures, would push total U.S. nitrogen consumption in '64 close to 5 million tons. Total potential supply (including synthetic ammonia, imports, organic nitrogen, by-product nitrogen) should then top demand by 298,000 tons.

A probable shift in the supply/demand balance is likely in '65, according to SN predictions; total nitrogen consumption is expected to increase to more than 5.3 million tons, and capacity buildups will broaden the supply/demand margin to some 486,000 tons (*see chart, p. 49*).

**U.S. Nitrogen Demand Forecast**
(1,000 tons)

| | Fertilizer | Industrial, Military | Export | Total |
|---|---|---|---|---|
| '60 | 2,700 | 890 | 250 | 3,840 |
| '61 | 2,950 | 955 | 150 | 4,055 |
| '62 | 3,200 | 1,030 | 100 | 4,330 |
| '63 | 3,450 | 1,100 | 100 | 4,650 |
| '64 | 3,700 | 1,180 | 100 | 4,980 |
| '65 | 3,950 | 1,270 | 100 | 5,320 |

In '65, the nitrogen supply will come from these sources: synthetic ammonia, 5.09 million tons; imports 400,000; organic nitrogen 30,000; by-product nitrogen from coking operations, 285,000. This compares with the following breakdown on estimated '60 supplies: synthetic ammonia, 3.9 million tons; imports, 300,000; organics, 30,000; by-product, 260,000; total potential supply, 4.49 million.

**Industrial and Military:** Nitrogen

**COMMERCIALLY AVAILABLE**

**"5-WAYS BETTER"**

**PVA PLASTICIZER**

**Versatile, new VIRCOL-189*** has come out of the laboratory to solve five big problems for plastic producers using partially hydrolized polyvinyl alcohol. Used alone or in combination with standard plasticizers, such as glycerine and diethylene glycol, VIRCOL-189 is *less hygroscopic ... less volatile* at high temperatures *... less flammable ... won't discolor* in aging ... provides *increased tensile strength.* Note the big difference in hygroscopic action in the table below.

**VIRCOL-189**—a colorless, mobile liquid—requires no change in normal PVA plastic production. Manufacturers use the same techniques and equipment employed with conventional plasticizing systems.

**Relative Hygroscopic Behavior**
***Percent Gain in Weight in 48 hours at 20°C with 98% Relative Humidity***

| VIRCOL-189 | Glycerine | Diethylene Glycol |
|---|---|---|
| 25.6% | 67.8% | 77.4% |

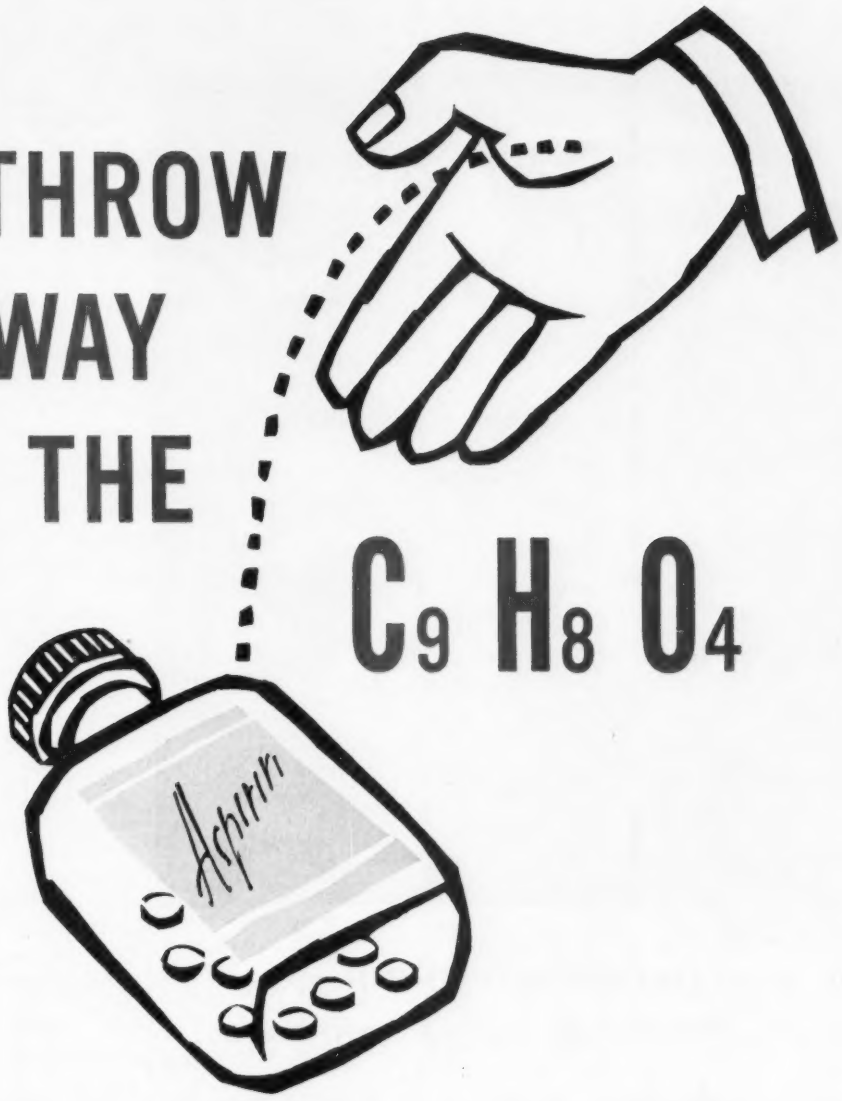
**For a VIRCOL-189 sample** and more information on plasticizing the better way, write to:

*Patent applied for.

V-C®

**Virginia-Carolina Chemical Corporation**
401 East Main Street • Richmond 8, Virginia

# THROW AWAY THE $C_9H_8O_4$




AMSCO is first in sales because AMSCO is first in technical aid. If solvent problems are giving you headaches...throw away the aspirin. Specify AMSCO. You'll get *what you want,* where you want it, when you want it.

**AMSCO**

**AMERICAN MINERAL SPIRITS COMPANY**

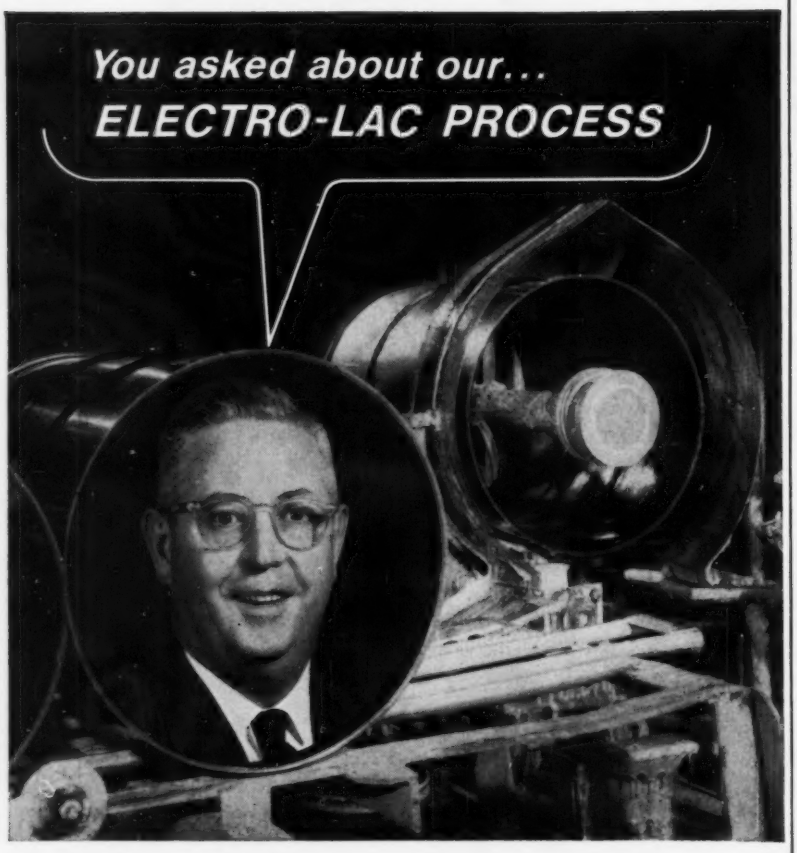
in its various forms goes, of course, into a wide variety of industrial applications, and into military needs that are hard to track down, still harder to predict. However, "potentially great" use in rocket fuels, commercial explosives and synthetic fibers bolsters expectations of significant gains in these nonagricultural markets. Although substantial, and growing, industrial/military markets, as a whole, run a poor second to the mammoth fertilizer demand; over the next half-decade, industrial and military consumption of nitrogen is expected to increase more than 40%, from 890,000 tons in '60 to 1,270,000 tons in '65 (*see table, p. 50*).

**Imports to Rise?** Nitrogen imports hit a peak of more than 500,000 tons in '53, then declined to a current level of about 300,000 tons/-year. The decline is attributed largely to more aggressive efforts by domestic producers who were desperately trying to make use of a huge overcapacity.

Because the U.S.—compared to most other nations—is a well-financed mass market, importers will likely try to at least maintain their present market volumes. During the next two or three years, they will have to fight hard for this market. As the domestic nitrogen surplus eases, however, it's possible that imports may rack up modest gains—perhaps about 100,000 tons, to the 400,000 tons/-year level in the '63-'65 period.

Incidentally, nitrogen imports—aimed primarily at agricultural markets—fall into two general, competitively differing, categories: (1) specialty products such as calcium cyanamide, calcium nitrate, and ammonium sulfate-nitrate, which have a modest, stable market; (2) more-competitive products, which comprise a major part of imported nitrogen and which absorb the brunt of competition from domestic products. These materials include sodium nitrate, ammonium nitrate, calcium ammonium nitrate, urea, ammonium sulfate.

Plain ammonia, the big hope of many nitrogen producers, isn't a big factor in the import market. And its future, therefore, seems to be free of the threats of direct foreign competition. How well U.S. producers sell in this situation seems to hinge largely, on their development of new markets.

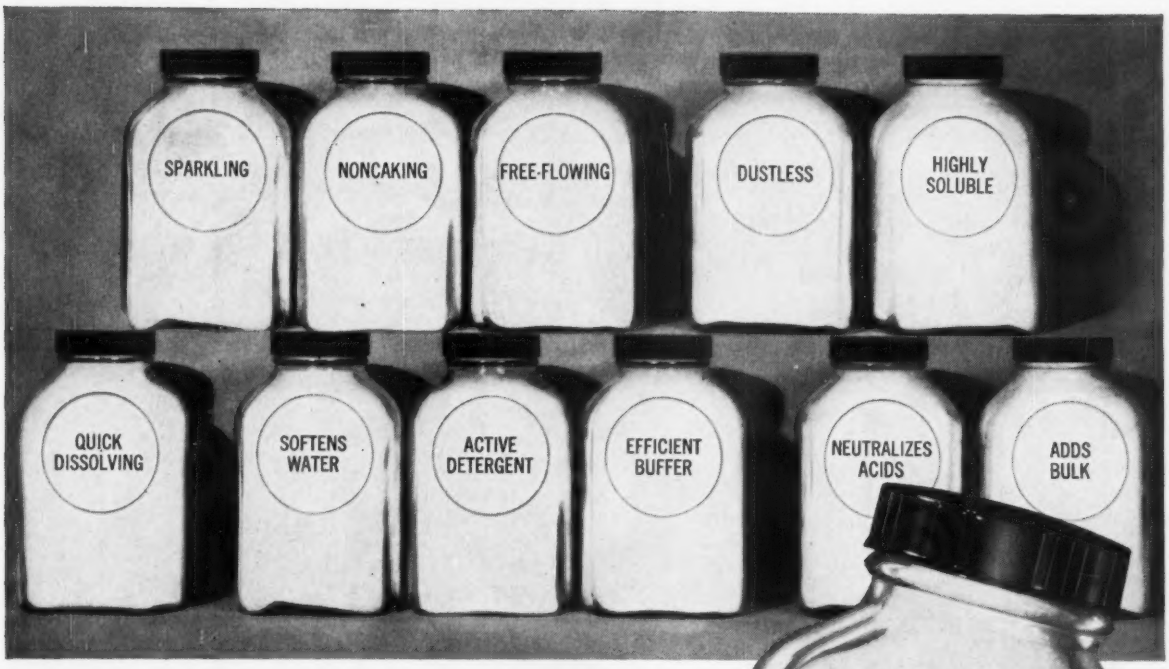

**Bob (in-the-drum) Billig, Republic Container salesman, says...**

"People keep asking why our electrostatically-applied lacquer coatings protect their products better," says Bob Billig, Republic salesman working out of Nitro, West Virginia. "They want to know how, in Republic's ELECTRO-LAC Process, a fine lacquer mist is uniformly dispersed from a high-speed distribution head and uniformly attracted (as a result of an electrostatic field produced in the drum) over the entire interior assuring uniform protection —no thin spots—even in corners and recesses.

"Well, sir, I'll tell you. But first I just want to say that the picture of me in the drum is a fake. They've taken a picture of me and a picture of one of our ELECTRO-LAC machines and very trickily put them together. I don't see why. There's nothing fake about ELECTRO-LAC.

"Anyway, about ELECTRO-LAC, I'll tell you. I feel very deeply that people should get details on how this process protects their products better. They can ask their Republic salesman or write Republic in Niles—container capital of the world."

**REPUBLIC STEEL**
**CONTAINER DIVISION**
**465 Walnut Street • Niles, Ohio**




# *To sample all these advantages in one alkali...*

# *Get your SAMPLE of*

You have *eleven good reasons* (count 'em!) for specifying Snowflake® or Snowfine® in processes and products—ranging from household and industrial cleansers to luxury bath preparations. You may even discover that these two granulations of Solvay® sesquicarbonate of soda offer you more features. Write for your liberal sample.

Sodium Nitrite • Caustic Soda • Calcium Chloride • Chlorine • Chloroform
Caustic Potash • Potassium Carbonate • Sodium Bicarbonate • Soda Ash
Ammonium Chloride • Methyl Chloride • Ammonium Bicarbonate • Vinyl Chloride • Methylene Chloride • Cleaning Compounds • Hydrogen Peroxide
Aluminum Chloride • Mutual® Chromium Chemicals • Snowflake® Crystals
Monochlorobenzene • Ortho-dichlorobenzene • Para-dichlorobenzene
Carbon Tetrachloride

Allied Chemical

**SOLVAY PROCESS DIVISION**
61 Broadway, New York 6, N. Y.

*SOLVAY branch offices and dealers are located in major centers from coast to coast. Send export inquiries to Allied Chemical International, 40 Rector St., N. Y. 6.*

**SOLVAY PROCESS DIVISION**
Allied Chemical Corporation
61 Broadway, New York 6, N. Y.

18-40

Please send without cost:

- ☐ A. Snowflake Crystal sample ☐ B. Snowfine sample
- ☐ C. Snowflake fact book
- ☐ Data on how these products can help my operation, described in attached letter.

Name_____

Position_____

Company_____

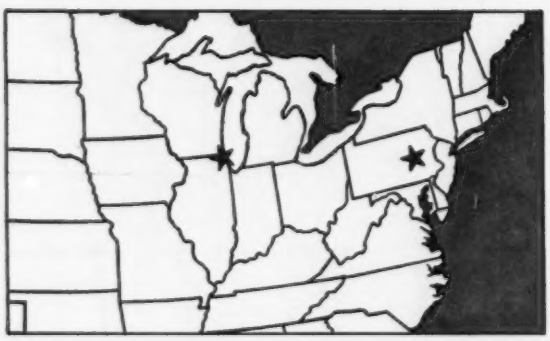
Phone_____

Address_____

City_____ Zone____ State_____

"Myself, I lean toward Spencer Service... it's wonderful!"

# Now... Overnight Delivery of Formaldehyde To These East Coast and Great Lakes States:



**Now fast, overnight delivery** of Spencer Formaldehyde is available not only from Spencer Chemical Company's Calumet City, Illinois, Works, but also from Danville, Pennsylvania. Made from Spencer's own methanol, Spencer Formaldehyde is formulated in the following grades: 37-1, 37-7, 44-1, 44-6, 45-1 and 50-1. For immediate shipment by tank car or truck, write or wire your nearest Spencer sales office.

SPENCER

"Tanky"... The Symbol of Spencer Service

## SPENCER CHEMICAL COMPANY

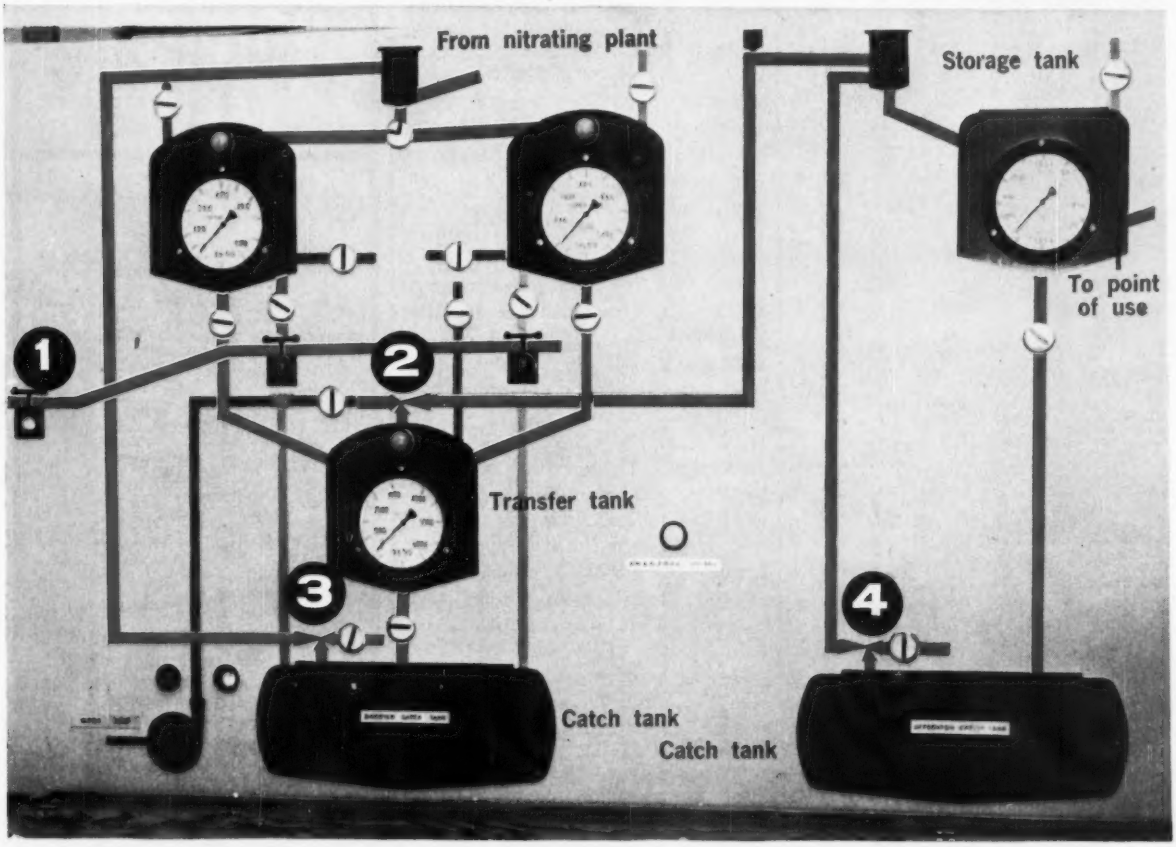
*America's Growing Name in Chemicals*

**SPENCER PRODUCTS:** Ammonia (Commercial, Refrigeration and Metal Treating Grades) • Aqua Ammonia • 83% Ammonium Nitrate Solution • Prilled Ammonium Nitrate • Argon • Methanol • Formaldehyde • Liquid $CO_2$ • Nitric Acid • Uranium Nuclear Fuels

**GENERAL OFFICES:** Dwight Bldg., Kansas City 5, Missouri

**DISTRICT SALES OFFICES:** 575 Lexington Ave., New York City; First National Bank Bldg., Chicago, Illinois

**Automatic nitroglycerine transfer system eliminates need for men at four points.**




1. ***SAMPLING: Sampling cup on trolley line eliminates dip sampling by man.***

2. ***TRANSFER: Jet ejector lifts material from transfer tank to storage; operation was formerly done by men pushing Angel Buggies.***

3. ***and 4. CLEANUP: Jet ejectors return material from catch tank to system, do away with hand-held bucket transfer.***

# Nitroglycerine Handling: Four Ways Safer

**Last weekend, Hanspeter Moser, an engineer for Dr. Ing. Mario Biazzi Soc. An. (Vevey, Switzerland) was winging his way back to Europe following successful startup of the first U.S. installation of his firm's jet-transfer system for nitroglycerine. The system is the latest step by the Naval Propellant Plant at Indian Head, Md., toward less-dangerous continuous nitroglycerine processing.**

For Moser, the transfer system isn't new. Several Biazzi systems have been installed in Europe. But the new one here is by far the world's largest: it lifts a water emulsion of nitro more than 30 ft., carries it through more than 500 ft. of polyethylene pipeline to storage. It moves 150 lbs. of nitro each minute.

Prime feature of the new system is a jet ejector (or eductor) that forms a water emulsion of nitroglycerine from the plant's Biazzi continuous nitration unit (*CW, Jan. 19, '52, p. 45*).

In dynamite plants, this jet transfer combined with continuous nitration has turned nitroglycerine manufacturing into a continuous process, less hazardous than a batch process because the quantities of free nitroglycerine in the system at any one time are small.

Du Pont has developed a similar system (U. S. Patent 2,694,404), moved it without fanfare into its own dynamite plants, offered licenses to others. But the Navy's Indian Head

SOLVENTS

TB&C

LOW ODOR

MINERAL

SPIRITS

T B & C offers an aliphatic solvent, a butylene alkylation derivative, having a low odor characteristic in the boiling point range of 360° to 405° F. Industry-accepted, this material has found many uses extending from paint formulation to dry cleaning. Delivered in tank truck, tank car and barge quantities. Other cuts in medium and high ranges also available.

For a more detailed explanation of the high qualities of T B & C Solvents write for our Product Data bulletin today.

TEXAS BUTADIENE & CHEMICAL CORPORATION

440 Bank of the Southwest Building
CApitol 7-3253 • Houston 2, Texas



plant, which must produce higher-purity material for missile propellants, demanded a somewhat modified plan: it must hold quantities of nitroglycerine in its most dangerous form for one-half to three-quarters of an hour while it is sampled and analyzed. Its system had to be designed to keep minimum quantities awaiting transfer to storage, reduce personnel hazard by eliminating manual sampling as well as the manually operated "angel buggies" (small rubber-tired transfer carts).

**One Slip:** The most dangerous spot in the plant has been the transfer house, according to William Brimijoin, head of the propellant ingredients division of the production and production engineering departments at Indian Head. "The floors are lead lined and are kept wet. The operators wear rubber shoes, and before the transfer system was installed, carried samples and material being returned to the system from overflow tanks in rubber buckets. But the NG is so sensitive that one slip is all it takes to set it off," he says.

"And if there's a shot (an explosion) at the transfer house, there isn't enough left to find out exactly what happened. About all that can be done is to speculate on what the operator was doing at the particular phase of the routine he had been instructed never to vary," he adds.

The new jet-transfer system, at an installed cost of $53,000, has eliminated the human element. Automatic controls are 500 ft. from the transfer house. They are interlocked to prevent sequences that might result in trouble. Here are operation details:

Nitroglycerine from the nitration unit flows by gravity to the transfer house, where it is diverted to one of two receiving tanks. Samples for analysis (potassium iodide or Abel heat test for stability) are withdrawn from the receiving tanks using a trolley sample cup arrangement. The sample cup moves into the transfer house on a trolley, is automatically positioned, withdraws a sample and then the cup returns to the sample station."

"Previously, an operator withdrew a dip sample by hand. We'd usually wait until we had a full tank because sampling took time, had to be done with care. The trolley arrangement

Dibutyl Sebacate

Outstandingly Efficient

Plasticizer

odorless • tasteless • colorless

for use with
Vinyls
Cellulosics
Synthetic Rubbers
Polymers

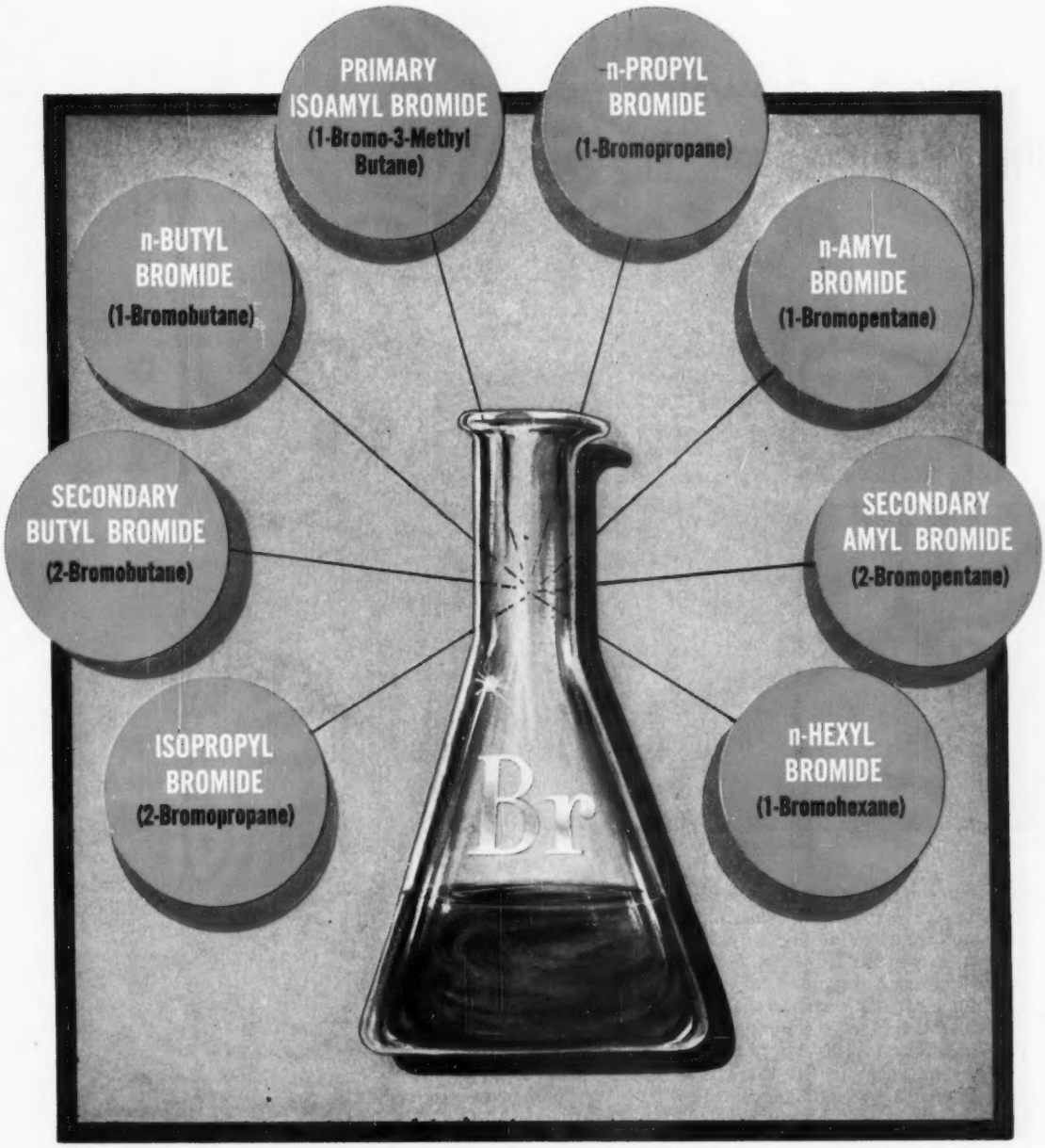
to prepare
Films and Sheeting
Extruded Products
Solutions
Plastisols and Organosols
Molded Products

Outstanding Performance Rating
- Excellent low temperature properties
- F.D.A. accepted
- Excellent ease of incorporation
- Very good heat blocking resistance
- Very good lubricity
- Low rate of extraction

THE FLAME AND THE FLASK
Symbol of Quality

Ask for information about other Plasticizers available for specific applications.

The C.P. Hall Co.
CHEMICAL MANUFACTURERS
5245 W. 73rd St., Chicago 38, Illinois
NEWARK • AKRON • CHICAGO
MEMPHIS • LOS ANGELES




The Benzol Products Company is familiar with these ALKYL BROMIDES in all their aspects. For more complete information on these products & other "Custom Manufacturing" variations, may we suggest you contact us.

BPC

**Benzol** PRODUCTS COMPANY

237 SOUTH STREET
NEWARK 5, N. J.

*Manufacturers of Fine Chemicals*

See page 138 – 1960 Chemical Materials Catalog — See page 66 – 1960 Buyers Guide Issue

## HOW C. F. DOWNEY BOX GETS

# Stronger Adhesives...Less Starch Loss

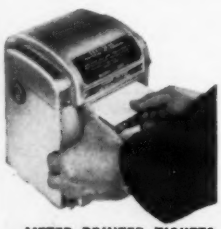
## WITH NEPTUNE *liquid* METERS

For uniform strength in shipping containers, C. F. Downey Box Division keeps a watchful eye on the adhesives used. They formerly measured the water into the starch-base mix by filling a large, square tank up to a mark. It was tough to hit the mark on the nose every time. Too *much* water would make the adhesive too thin, and it was difficult to add starch to the finished cook. Too *little* water and the adhesive had to be dumped quickly before it clogged the tank and lines. It cost $100 every time an error wasted a batch.

Now an accurate Neptune meter does the measuring...with assured results and no losses or rejects. The meter pays for itself over and over again in starch savings alone.

Similar savings in time and ingredients can be made in *your* plant, by adding Neptune meters wherever liquids are batched, blended or transferred. Tell us what you want meters to do for you and we'll gladly tell you the best, most economical way. Write today for Bulletin 566.

See Neptune data pages in Chemical Engineering Catalog.



**METER-PRINTED TICKETS** give dispute-free record of every batch . . . perfect for quality control, cost accounting, inventory. Other Neptune features: Auto-Stop quantity control; Auto-Switch electrical control for pumps; Stainless Steel construction.

**NEPTUNE METER COMPANY**
19 West 50th Street • New York 20, N.Y.

neptune

Branches in: ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER • LOS ANGELES • LOUISVILLE • NO. KANSAS CITY, MO. • PHILADELPHIA • PORTLAND, ORE. • SAN FRANCISCO (Millbrae) • In Canada: TORONTO 14, ONT.




gets our sample in three minutes, enables us to cut our batch size. If we could get a continuous-analysis technique to replace the Abel heat test, we could run the process on a completely continuous basis, send material directly to storage," says Brimijoin.

Biazzi reportedly is working on a continuous test method, which if successful, could put the Indian Head plant on a continuous basis.

Commercial dynamite plants do run on a continuous basis because the nitroglycerine can be stabilized immediately in the dynamite formulation; only tests for moisture need be run. Propellant formulations require better stability of the nitroglycerine, more critical and time-consuming analysis before storage.

**Jet Transportation:** After testing, the nitroglycerine is simply dropped from the receiving tank to a transfer tank. Water at 140 psi., forced through a jet ejector on top of the tank, creates a suction (aspirator effect) which draws the nitroglycerine up into the jet. A water emulsion is formed, jetted by pipeline to a constant-head storage tank where the emulsion breaks and the water rises.

"The emulsion is critical. As long as it doesn't break, the nitroglycerine can be handled safely. But if the emulsion breaks in the pipeline, the water and nitroglycerine will flow in layers — a dangerous situation because a shot in the storage or transfer areas would travel through the pipe," says Brimijoin.

Biazzi has found that a water-nitroglycerine ratio of almost 1:1 and flow rates above 1 meter/second keep the emulsion from breaking. Du Pont's system, according to the patent, calls for flow rates of the same order, emulsions of at least 30% water.

Fear of nitrogylcerine left in process in minute quantities is real; as it loses stability and turns acid, it detonates easily. For this reason, pipelines are now being made of virgin polyethylene, which does not absorb the nitroglycerine.

And pneumatic controls are used in the transfer house; signals are converted to electrical outside.

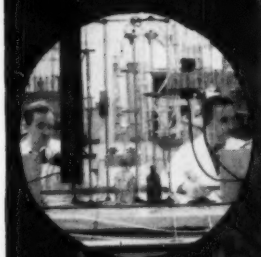
At one time, nitrogylcerine processors were reluctant to change from processing techniques in which batches were isolated where possible. Now they are finding that continuous processing can add to safety.

Chemico's modern research and development center is staffed and equipped to provide industry with a full range of bench scale and pilot scale development services, including:

- ★ Process development and evaluation
- ★ New process research
- ★ Process improvement
- ★ Efficiency improvement of unit operations
- ★ Development of new equipment and products

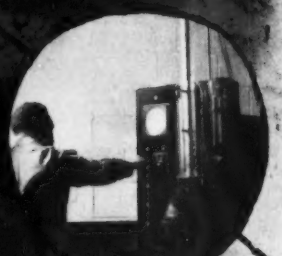
If an idea is economically sound and technically feasible, Chemico can put it into commercial operation in the shortest possible time. Each research contract is supervised by engineers and technicians familiar with industrial processes, equipment, and designs. Therefore, the transition to profitable commercial application is smooth and efficient. The client can be assured that Chemico will undertake such activities in the framework of a completely confidential relationship.

If you are interested in learning more about Chemico's research activities, please address your inquiries: Attn: TECHNICAL DIRECTOR, at the address below.



# RESEARCH

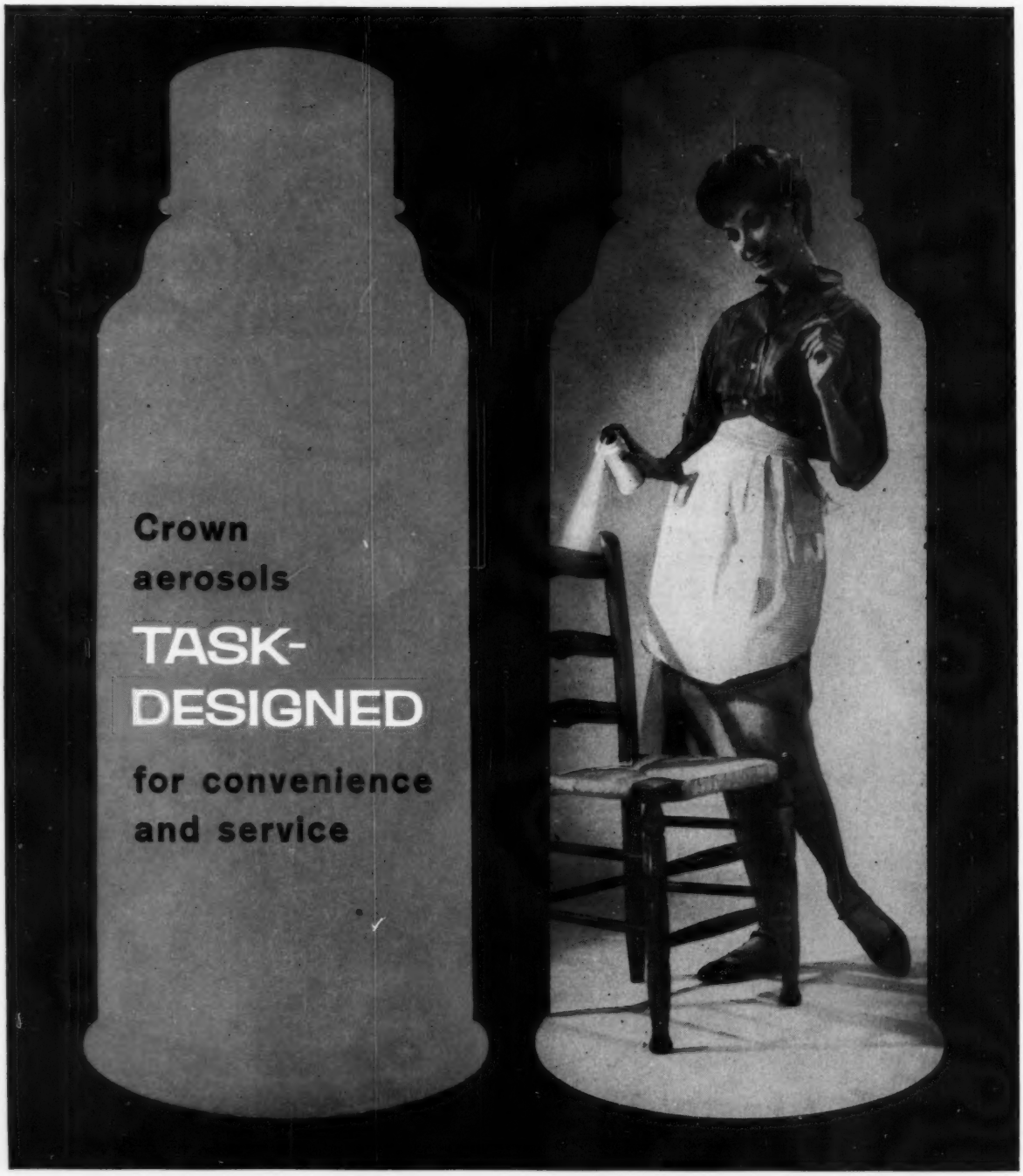
## from an engineering point of view



**CHEMICO**

CHEMICAL CONSTRUCTION CORPORATION
[illegible] West 43rd Street, New York 36, New York

CHICAGO • DALLAS • HOUSTON • PORTLAND, ORE. • TORONTO • LONDON • PARIS • JOHANNESBURG • TOKYO




*Task-Designed* aerosol cans by Crown—pioneer and leader in the aerosol field—help put new products on the market and add to the sales appeal of familiar products. Aerosol shellac packed in Crown aerosols, for example, is always handy, easy to use, and gives outstanding results.

Crown Cork & Seal Co. was the first to manufacture disposable aerosol cans. During the years since, our engineers have acquired vast experience in solving the problems of aerosol packaging. Crown aerosol facilities have been increased to speed service to you.

Crown aerosols are available in sizes from 6 to 16 ounces. May we send you more details?

CROWN

*for cans • crowns • closures • machinery*

CROWN CORK & SEAL CO., INC., 9300 Ashton Road, Philadelphia 36, Pa.

# Technology
## Newsletter

CHEMICAL WEEK
April 2, 1960

**Electron-beam-melted (ebm) steels** competitively priced with vacuum-arc products are coming. Stauffer-Temescal is now offering pilot quantities of ebm alloys—stainless and nickel-alloy steels—in ingots up to 6-in. diameter; it plans to produce larger sizes at a 50-tons/month capacity by next spring. The company will begin construction in July of a 1,500-kw. ebm furnace, expects to increase ingot sizes to 20-in. diameter by the time the facility reaches full-scale production.

S-T estimates that ebm processing costs may be as low as $1-2/lb. for some alloys, claims products will be superior, in certain respects, to competitively priced vacuum-melted metals. The company will continue to build and sell electron-beam furnaces, hopes to prove the marketability of ebm alloys to potential equipment customers. Wah Chang has bought three S-T furnaces for its Albany, Ore., plant (*CW Technology Newsletter, Feb. 7, '59, p. 68*), is now handling much of the custom melting of refractory alloys previously done by Stauffer-Temescal's developmental facilities in Richmond, Calif.

**Two new chemicals appear effective against cancer** in certain cases, according to Dr. Arnold Welch of Yale University School of Medicine. The compounds, azauridine and iododeoxyuridine (IUDR), were prepared by California Biochemical Corp. (Los Angeles). Both have shown promise in the treatment of leukemia, tumors, and other types of cancer but they are not considered "cures" and require more research. The chemicals are currently expensive — $5,000/lb. for the IUDR, $20,000/lb. for azauridine. But, Calbiochem President Alfred Deutsch says, demand could push IUDR to less than $2,000/lb. and azauridine to $1,000/lb.

•

**Two new transparent thermoplastics for molding** have been developed by L.I.R.C. (Milan, Italy), a joint research venture of Ledoga S.p.A. and Snia Viscosa S.p.A., both of Milan. Both reportedly feature higher temperature resistance than either polystyrene or polymethylmethacrylate. One is a copolymer of dimethylitaconate and styrene, called Dialux A. The other, Dialux C, is a ternary copolymer of dimethilitaconate, styrene and acrylonitrile. Details will be given by L.I.R.C. researchers at the American Chemical Society national meeting in Cleveland April 5-14.

•

**Oxides of nitrogen are reduced 80-90% in auto exhaust** by a new technique researched by the Air Pollution Control District (Los Angeles) and the Engineering Dept. of University of California at Los Angeles. A small amount (15-18%) of cooled exhaust gas is introduced into the engine intake system by means of a tailpipe-to-carburetor, tube and valve device costing less than $15. Other smog formers (hydrocarbons and carbon monoxide) must still be controlled by afterburners or

other devices. Benefits of the method: reduces engine "knock," lessens the need for antiknock compounds in gasoline, permits high-compression engines to operate on lower-cost, lower-octane gasoline. There is no uncorrectable power loss in the engine, nor increase in unburned hydrocarbons in the exhaust.

Why the nitrogen oxides are reduced by this method isn't clear as yet, although it is believed that the exhaust gas dilutes the oxygen content of intake air, thus lowers the flame temperature.

•

**Three new developments on tap from Pittsburgh Plate Glass:** a polishing technique for plate glass; a multipurpose glazing sealant; a broad series of light- and heat-controlling automobile glass.

The plate glass polishing method uses chemicals rather than conventional grinding and polishing with sand and flannel-covered wheels. The technique isn't commercial yet, but a production line is being installed at the Cumberland, Md., plant.

Equipment for the glazing sealant has been installed at the Pittsburgh plant, and the product, a urethane called Deurathane, will soon go commercial. The new automobile glass products are already in use, are tinted glass with heat-absorbing inner layer or metallic deposit on outer surface.

•

**Low dose radiation processing of perishable foods** will be researched under a new Atomic Energy Commission program expected to cost $5 million in the next five years. The AEC program will stress basic studies in food chemistry, microbiology, wholesomeness testing, preservation factors of shelf-life extension and radiation processing technology.

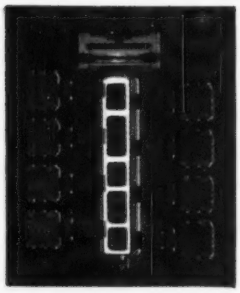
Over a six-year period, the Army Dept. will also spend $5 million on food irradiation research, and has proposed construction of a $1.8-million radiation facility, including a cobalt-60 source, variable-voltage linear electron accelerator and associated facilities, with emphasis on high dose treatment of foods.

•

**A new hydrorefining process that boosts gasoline yields** was unveiled by Universal Oil Products this week at a meeting of Western Petroleum Refiners Assn. in San Antonio, Tex. The process—dubbed Lomax—employs a fixed catalyst bed, operates in a hydrogen atmosphere under pressure.

In contrast with catalytic cracking, Lomax produces a much smaller quantity of light hydrocarbon gases and very low olefin content in products. It's also claimed that light naphtha (butanes, pentanes and hexanes) produced by the new process is composed predominantly of branched isomers. An important advantage of Lomax is its ability to convert heavy vacuum gasoils into varying proportions of gasoline and light distillates.

# WILL YOUR NEXT BALANCED OPPOSED COMPRESSOR HAVE ALL OF THESE "HIDDEN VALUES"?



No, it won't! Even if you choose a Worthington compressor, you'll get only 23 of the 24 "hidden values" pictured below. (Just to pique your interest one is fictitious. For identification of the phony feature, see page 72.)

Compressors should be evaluated on performance, we think you'll agree. But performance is determined by factors which aren't easily checked against service conditions and data. These are the factors we call "hidden values." It will pay you to evaluate these values the next time you specify a compressor. Worthington Corp., Clinton Street and Roberts Ave., Buffalo 5, N. Y. 36-8

WORTHINGTON

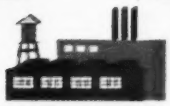
**OPTIC COMPARATOR** is used to check connecting rod bolt threads for uniform angles, lead and form.

**WIRE ALIGNMENT** during assembly using electronic equipment minimizes field alignment problems.

**FACTORY ASSEMBLY** of intercooler and interstage piping reduces installation problems and costs.

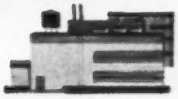
**COMPOSITION TEST** determines constituents of molten iron in each ladle before any casting is poured.

**HONING** of connecting rod crankpin and crosshead pin ends results in tighter fits, no loose shells.

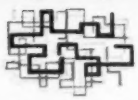


**INTEGRATED DIV.** includes foundry, manufacturing, sales, service and engineering in one location.

**ULTRASONIC TEST**— an advanced method of examining certain critical parts for internal quality.



**$1,000,000 ADDITION TO LABORATORY** assures sound equipment designs based on actual research.



**ANALOG/COMPUTER** simulates wide range of actual operating conditions for optimum design analysis.

**PROFILOMETER** inspection of highly finished parts assures easy break-in and long life.

**KOLENE PROCESS** removes impurities from bearing shell that weaken bond between it and babbitt.

**CAST-IN LUBE OIL SYSTEM** with internally drilled oil passages eliminates crankcase "plumbing."

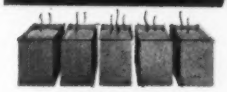
**MAGNAFLUX AND MAGNAGLO** inspections are widely used to expose surface imperfections.

**FINISHED GROUND BEARING SHELLS** provide positive full-contact backing for long life.

**DESTRUCTION TEST** of complete compressor cylinders verifies engineers' design calculations.

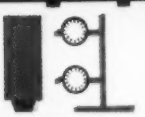
**REMOVABLE DOWEL** locks piston rod to crosshead — prevents turning due to loosened crosshead nut.

**STEEL TIE BAR,** keyed and bolted in place, strengthens frame and maintains the original alignment.



**PARCO-LUBRITING** of critical wearing surfaces completely eliminates most start-up scuffing problems.

**FEATHER VALVE**— industry's preferred compressor valve—is efficient, quiet, and low in maintenance.



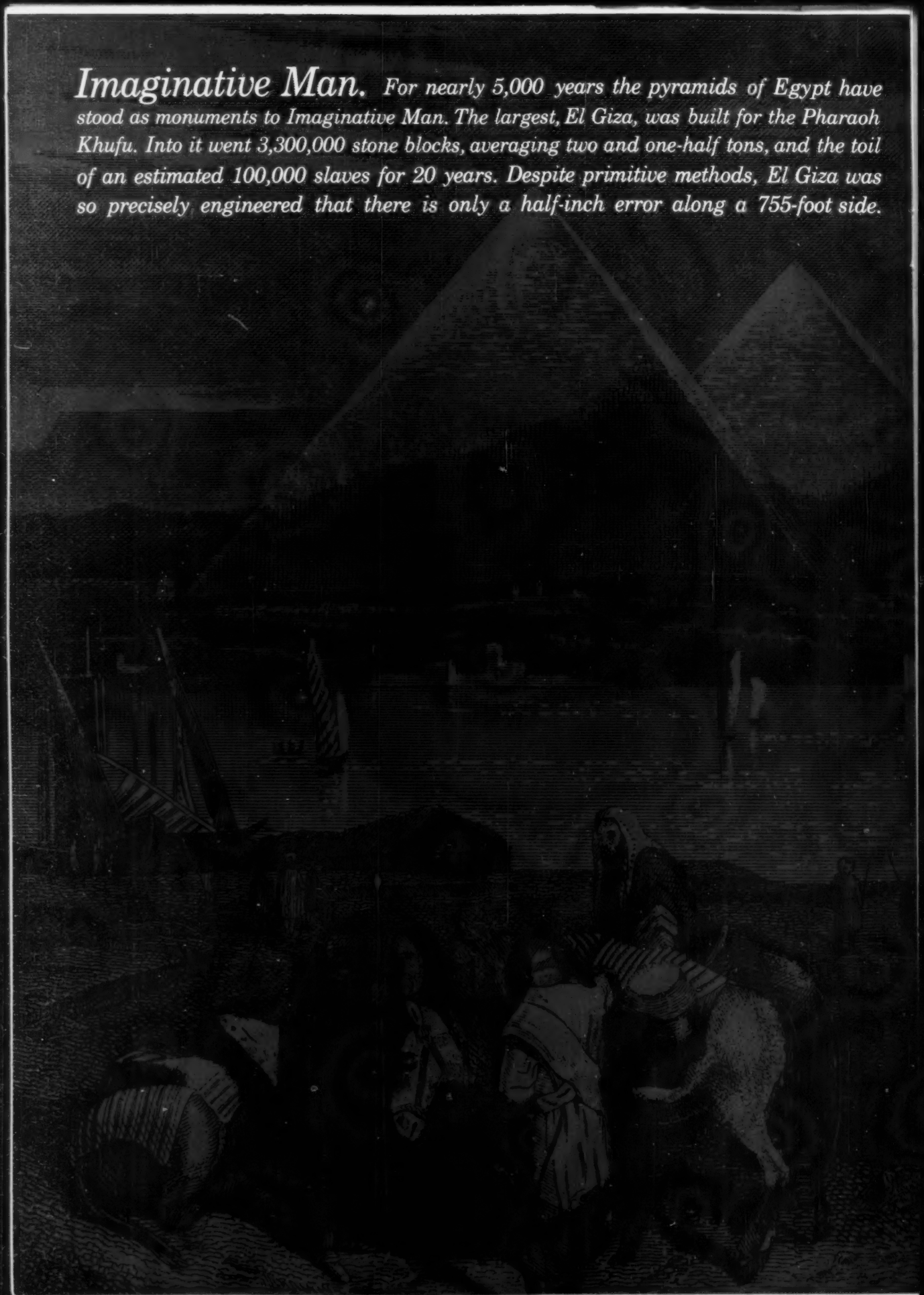
**CROSSHEAD SLIPPER ADJUSTMENT** within one-thousandth of an inch assures much longer packing life.

**THERMODYNAMICS SECTION** analyzes each application to size unit and determine its performance.

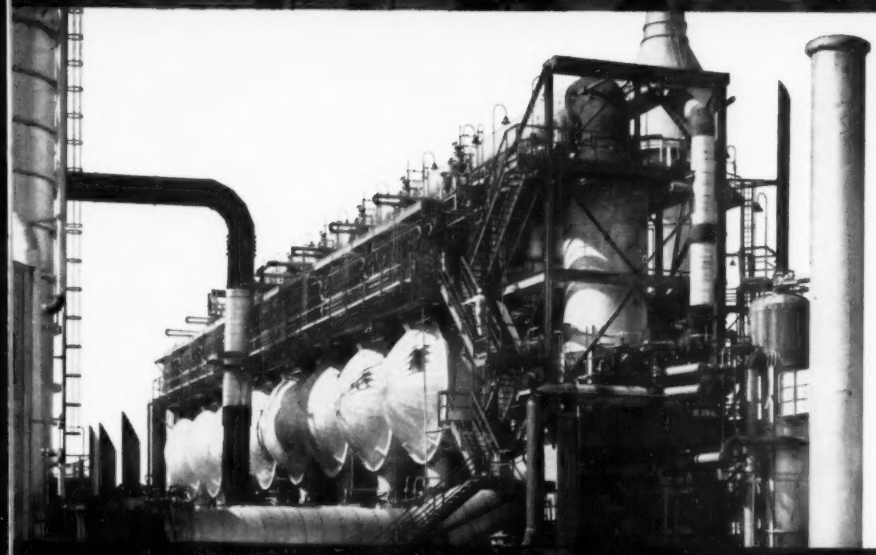
**SALES AND SERVICE INTEGRATION** recognizes kinship of one to the other. One man administers both.

**ADJUSTABLE ROLLER MAIN BEARINGS** feature low friction losses which help to extend compressor life.

**AIR CONDITIONED GAUGE ROOM** has master gauge blocks constantly used to check instruments.



*Imaginative Man.* *For nearly 5,000 years the pyramids of Egypt have stood as monuments to Imaginative Man. The largest, El Giza, was built for the Pharaoh Khufu. Into it went 3,300,000 stone blocks, averaging two and one-half tons, and the toil of an estimated 100,000 slaves for 20 years. Despite primitive methods, El Giza was so precisely engineered that there is only a half-inch error along a 755-foot side.*



A notable achievement of modern Imaginative Man is the chemical industry's precise control of high polymers. This technology has already had far-reaching effects and promises many future rewards, including the release for food production of vast land areas now utilized to grow natural high polymers.

A high degree of technical competence, broad experience, skilled manpower and resources enable Fluor to design, engineer and build continuous-flow plants that produce high polymers to precise laboratory standards.

FLUOR

*Designers · Engineers · Constructors*
*for the Process and Power Industries*

contributions of
UOP RESEARCH

**no wonder beavers love refiners . . .**

Not one beaver had to be sacrificed to make our model's lovely coat. Thanks to the wonders of chemistry, this garment, like simulated furs of other creatures, is made from synthetic fibers spun from petrochemicals.

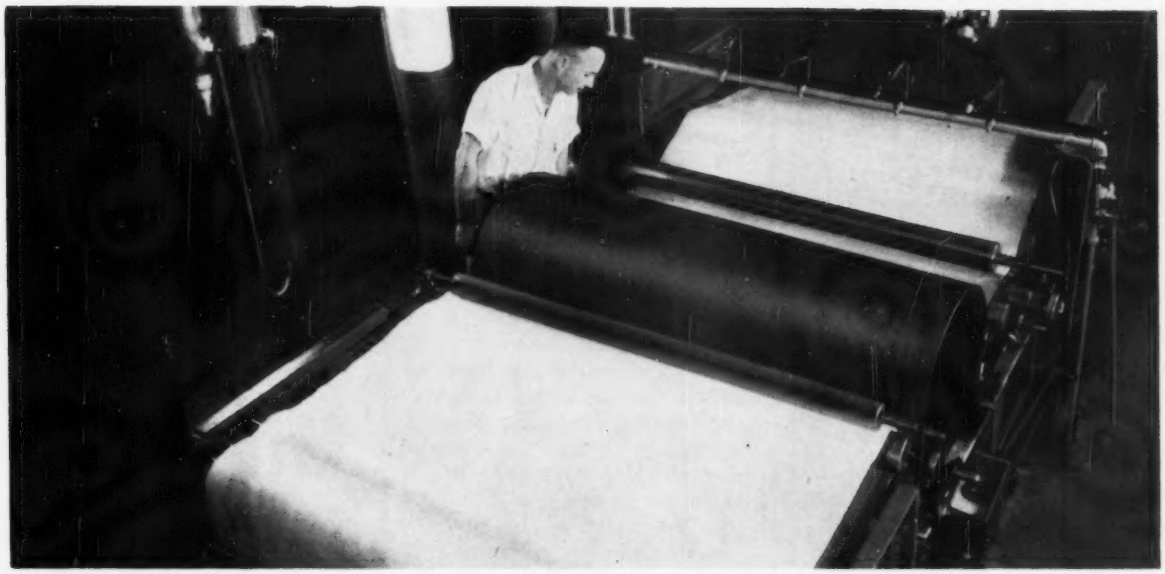
In addition to "furs" and fabrics, many industrial products are made from or strengthened by synthetic fibers. And as chemists know, synthetic rubber, plastics, detergents, fertilizers and other materials are made better and cheaper with petrochemicals . . . which now account for more than one-half the dollar value of the entire production of our great chemical industry.

UOP processes for producing petrochemicals are used by both petroleum refiners and chemical manufacturers. Practical, efficient and economical to operate, UOP process units assure petrochemical products of highest purity.

UOP®

**UNIVERSAL OIL PRODUCTS COMPANY** DES PLAINES, ILL., U.S.A.

WHERE RESEARCH TODAY MEANS PROGRESS TOMORROW



**Nonwoven fabrics (shown above) are said to be more durable using new acrylic latex.**

# Acrylic Latexes Take a New Textile Tack

**This week B. F. Goodrich Chemical Co. (Cleveland) went into full-scale production at its Louisville, Ky., plant of a new acrylic latex, Hycar 2671 (CW Technology Newsletter, March 26), which the company has been field-testing under the experimental designation, Hycar 2600X67.**

If it lives up to the company's hopes, it could make Goodrich a strong challenger in an area now dominated by long-time acrylic maker, Rohm & Haas. Initial claims for the Goodrich material make it sound as though the company had set its sights on Rhoplex B5 and Rhoplex B15, two of the big bread-and-butter items in Rohm & Haas' latex catalog. A sharply competitive battle could be shaping up for the near future.

**Big in Textiles:** Although Goodrich talks of applications in the leather and paper fields, the new latex is primarily designed for application in the textile industry as backing for upholstery and drapery fabrics, binder for nonwoven fabrics, and adhesive or laminating agent.

Goodrich officials have especially high hopes for the nonwoven application, say that the product makes practical the more extensive use of nonwovens for outerwear by giving them characteristics they lacked in the past, i.e., good washability and drycleanability.

Goodrich attributes this greater durability to the "reactive" nature of its new latex; i.e., there's cross-linking within the acrylic latex itself, as well as linking with the cellulosic nonwoven materials.

As a fabric adhesive and laminating agent, the new latex may permit new techniques in the assembling of apparel, promote such innovations as stitchless seams and hems as well as the adhesive attachment of zipper fasteners. Goodrich has already put together some sample constructions of this type, using both wet-adhesive and heat-sealing methods, and in doing so has had no difficulty with such problems — encountered with earlier materials — as weak seams, stiffening or fabric discoloration.

Acrylic latexes aren't new, have been used in the textile field for some time as binders and finishers to give softness, good hand, light and heat stability to fabrics. However, they've had some drawbacks; and on the overcoming of two of these, Goodrich bases its hopes for the new latex.

**Curing the Cure:** Actually, the drawbacks that Goodrich refers to are not inherent in the acrylic latexes themselves; rather, they arise from the thermosets that have been added to the latexes. It has been necessary, in order to enhance durability to washing and drycleaning, to add such thermosets as urea-formaldehyde or melamine-formaldehyde to the latex. This erased much of the durability problem, but gave rise to two more: yellowing and short pot life for the latex. The consumer was unhappy when his freshly washed and bleached wash-and-wear shirt turned brown during ironing as a result of chlorine retention, and the fabric maker was unhappy when coating material congealed. Goodrich thinks its new latex, which doesn't need a thermoset additive, has solved both of these problems.

Heavy emphasis on the one-component system will obviously be a feature of Goodrich's sales pitch for the latex. By eliminating additives, the implication is that the processor is going to be able to save both time for compounding and money for raw materials.

Other Goodrich claims for Hycar 2671: good resistance to soil redeposition, compatibility with all common textile finishing agents, and

CENTURY CHEMICAL OFFERS YOU THESE QUALITY CHEMICALS AND INTERMEDIATES

**NON-TOXIC FUNGICIDES & PRESERVATIVES** for Adhesives, Coatings, Cosmetics, Drugs, Foods, Glues, Inks, Paints, Plastics, Textiles.

**FINE CHEMICALS** for Agriculture, Cosmetics, Foods, Pharmaceuticals, Metal Finishing; and for Chemical, Drug, and Dyestuff synthesis.

**PIPERAZINE & DERIVATIVES** for Fibers, Insecticides, Pharmaceuticals, and Animal Health products.

**AMINE SALTS** for crystalline sources of normally gaseous amines. Also employed as resin catalysts and acid donors in metal solders.

**SPECIAL ASPHALT PRODUCTS** for Paving, Roofing, Tiles, Coatings, and other Asphalt materials.

*For further information write to:*

**CENTURY CHEMICAL CORPORATION**
*60 E. 42 St., New York 17, N. Y.*

## SPECIALTIES

applicability over a wide range of materials including cottons, acetates, rayons, and acrylics. Cost, on a 50%-solids basis, will initially range around 25¢/lb.

Other areas where Goodrich looks for markets for its latex are paper manufacture (the latex is said to exhibit considerable resistance to heat and heat aging) and leather finishing (where it's said to cut down cracking at extremely low temperatures).

In addition, Goodrich tells CHEMICAL WEEK it feels its new material has gained a strong foothold in the upholstery-backing trade and in the luggage field, where the latex has overcome some adhesive problems.

**Big Hurdle:** Obviously, Rohm & Haas isn't sitting idly by as Goodrich makes a play for the business R & H has had for so long.

Just last month, in fact, Rohm & Haas revealed that its experimental dispersion HA-922B — a material markedly similar to the Goodrich latex —has now been given the commercial name Rhoplex HA-8 and would be sold at a truckload price of 25¢/lb.

The new latex is described by R & H as a self-cross-linking acrylic polymer in nonionic emulsion form. Though curing temperatures as low as 250 F are cited, it's thought that in application to nonwoven fabrics materials, a temperature of around 325 F (as with the Hycar material) will be needed.

By challenging R & H in this field, Goodrich is tackling a company that seems to have an edge both in experience and in raw-material position. R & H has been supplying acrylic latexes three times as long as has Goodrich.

On the other hand, Goodrich has a strong backlog of experience in the synthetic latex field, is the largest supplier of nitrile and vinyl latexes, has been in the latex field since the late '30s.

While Goodrich probably can make higher acrylic esters, it probably has to buy the lower ester materials on the open market; R & H, on the other hand, is basic in both the higher and lower ester materials.

Goodrich knows these factors as well as anyone in the industry. The company's decision to buck strong competition makes it apparent that Goodrich intends to become a major factor in the acrylic latexes field.

Award-winning 112-page
**Minnesota SITE BOOK**

Site-see from your desk! This factual brochure shows with photos latest industrial details of 123 Minnesota cities, and lists 424 current site areas with name of local contact. Write, on your firm's letterhead:

**Dept. of Business Development**
**State Capitol, Dept. St. Paul 1, Minn.**

America's Largest Continuous Producer of
**ALUMINUM ISOPROPYLATE**

CHLORO ALUMINUM DIISOPROPOXIDE
ALUMINUM MONO-SEC-BUTOXIDE DIISOPROPOXIDE

*Dependable Deliveries from a Dependable Supplier*

**CHATTEM CHEMICALS**

Chattanooga 9, Tennessee
Address Inquiries to:
F. L. BODMAN COMPANY
101 N. 33rd St., Philadelphia 4, Pa.

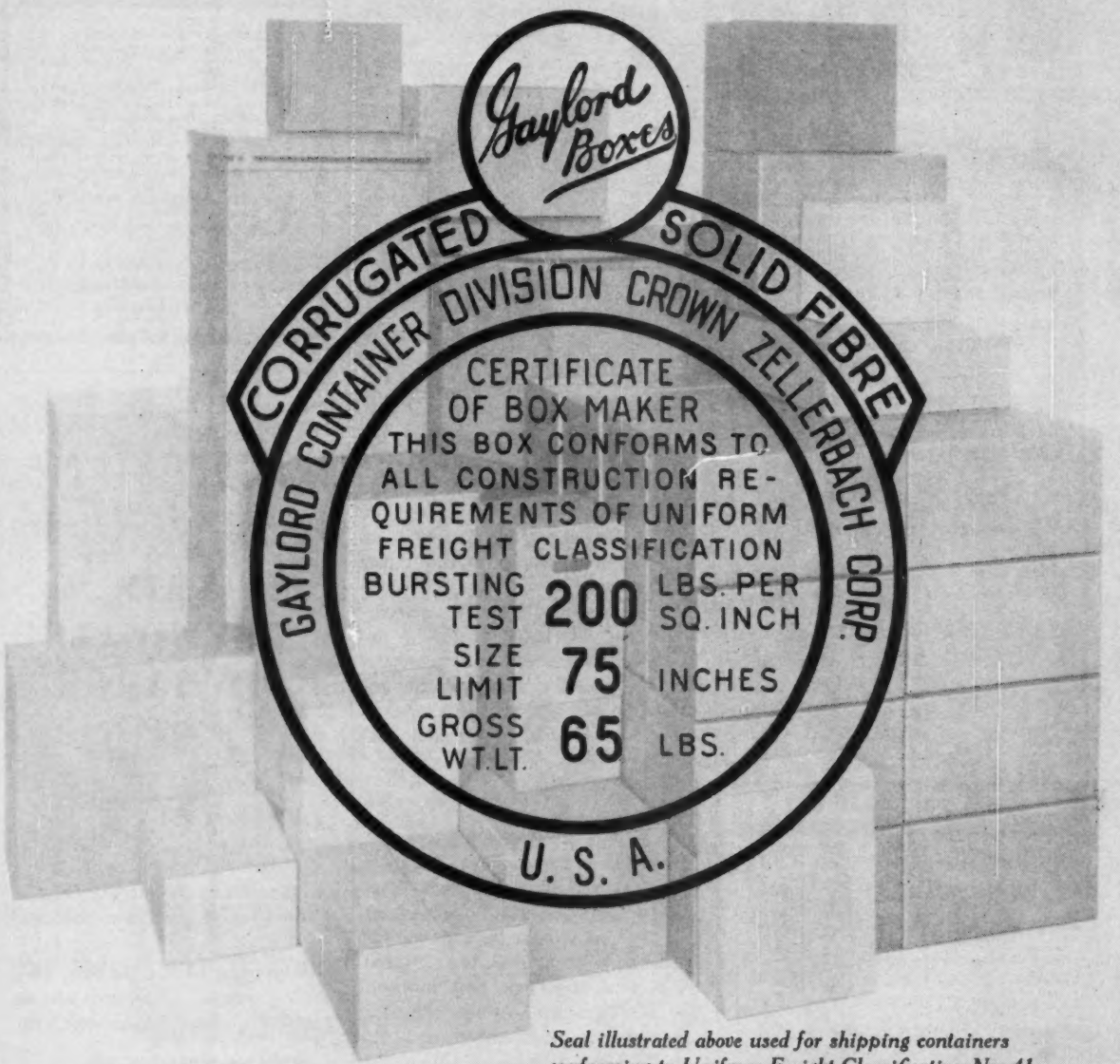
# *This is only one proof of* GAYLORD *quality*

Here you read the measurable qualities in Gaylord Containers.

But how do you measure experience and ingenuity . . . which are *extra* qualities built into every Gaylord box?

Gaylord is part of a completely-integrated, nation-wide organization of packaging talents, devoted to delivering the most efficient, most economical container you can buy.

Your nearby Gaylord Man can prove this. Why not let him try?



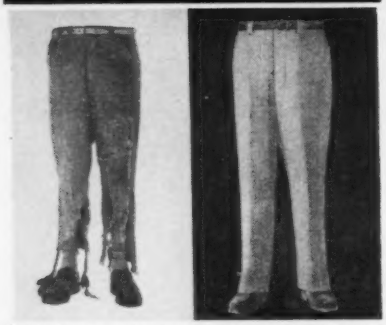

*Seal illustrated above used for shipping containers conforming to Uniform Freight Classification No. 41.*

**CROWN ZELLERBACH CORPORATION**
**GAYLORD CONTAINER DIVISION**

IN CANADA · CROWN ZELLERBACH CANADA, LTD. VANCOUVER, B. C.

HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

STILL BUYING COTTON or WOOL WORK CLOTHES?



Cotton work pants after less than one week under corrosive conditions.

Worklon pants of 100% Dacron after months of wear under same corrosive conditions.

Are you still watching your profits being eaten away by acids and corrosive chemicals? Why not switch to WORKLON **acid- and caustic-resistant** industrial apparel! **Save** as hundreds of plants and laboratories are now doing...yes, save up to 93% with WORKLON garments of 100% **Dacron*** and 100% **Dynel.**

A variety of **lint-free** and **static-free** acid-resistant styles to meet your every requirement. Read complete details in the new Worklon catalog just off the press. **New lower prices ...larger selection** of garments for both MEN and WOMEN. Send coupon for your **free** copy now!

Quality Fabrics by

TRAVIS®

**Fabrics, Inc.,**

leading specialists in the development of unique constructions and blends for the specific needs of modern industry.

*DuPont's reg. t.m. for its polyester fiber.

WORKLON

ACID-RESISTANT INDUSTRIAL APPAREL

Worklon, Inc., Dept. CW-40
253 West 28th St., New York 1, N.Y.
Kindly send free Worklon catalog

name .....
co. name .....
address .....
city ..... zone ..... state .....


## SPECIALTIES

### TBA Boost?

**Esso Standard** (New York) may be starting a new trend in TBA merchandising with its recently opened, experimental Moto-Mat service station near Gramercy, La. This offbeat station offers some unheard-of services for its customers: hostesses, children's play area, air-conditioned lunchroom and lounge, vending machines for soup, sandwiches, and the like.

The Moto-Mat's air-conditioned salesroom carries a limited supply of Esso's line of tires, batteries, and other accessories. If the "laboratory" station is successful, Esso plans to open a chain of similar stations. It will be a big change from typical service station decor — oily rags, smudged girly calendars, peeling chairs and a cracked plastic radio.

### Buying Guide

**The American Hotel Assn.** (New York) is now distributing the '60 edition of its Certified Products List, giving brandnames and suppliers of cleaning products, paints and textiles that meet the association's standards.

Some 433 items, provided by 133 specialties companies, are endorsed this year. The list includes 233 products put out by 94 makers of paints, cleaners and polishes; 200 textile items have also been certified by their 39 manufacturers as having met the requirements.

Ten other national trade associations have purchased copies of the purchasing guide for their members. Among them: American Library Assn., American Motor Hotel Assn., and National Assn. of Hospital Purchasing Agents.

## PRODUCTS

**Label Law Update:** The Chemical Specialties Manufacturers Assn. (New York) has revised its Compilation of Labeling Laws and Regulations for Hazardous Substances. The 25-page addition contains new laws to Sept. '59. Members will receive one free copy; price to nonmembers is $3.

•

**Antiseize Line:** The Crawford Fitting Co. (884 East 140th St., Cleveland) has brought out a line of antiseize and lubricating compounds

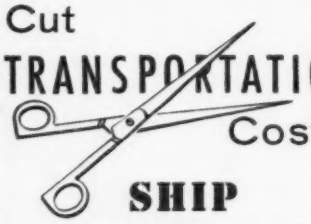

INCOME TAXES are going DOWN

for everybody in MISSISSIPPI

- Executives will weigh this mandatory tax reduction program in their future plans.
- Top Income Tax bracket will be reduced 50%, graduated over a six-year period.
- Personal Exemptions are increased $1,000; individuals now $5,000, married couples $7,000.
- Main Street merchants view tax reduction as a very real incentive to industrialization.

For Further Information Contact
MISSISSIPPI AGRICULTURAL AND INDUSTRIAL BOARD
Jackson, Mississippi

Cut TRANSPORTATION Costs!



SHIP CHEMICALS BY BARGE

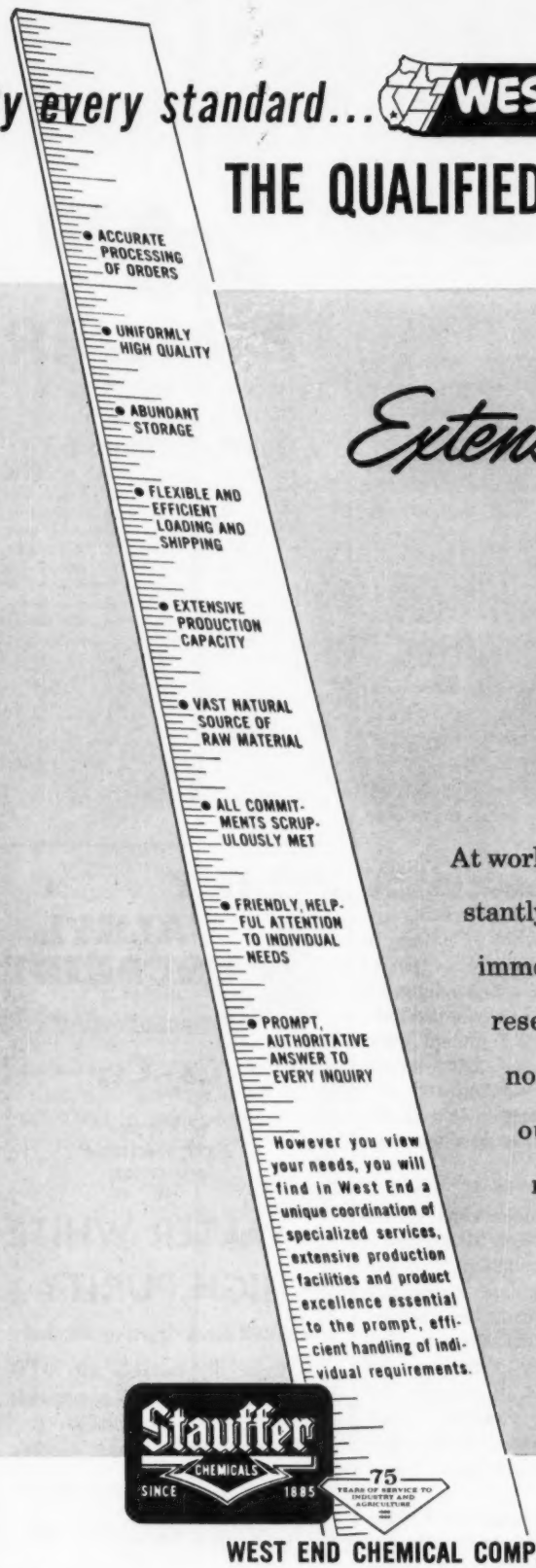
Working closely with the Chemical Industry in the solution of special problems.

CHEMICAL BARGE LINES, INC.
LEA RIVER LINES, INC. • INDIAN RIVER LINES, INC.
222 W. EIGHTH ST. WILMINGTON 1, DEL.

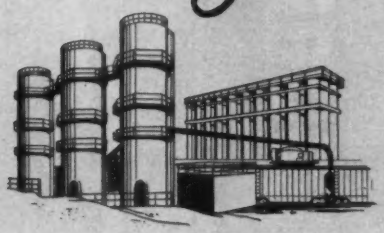
Call Philadelphia, Pa.:
LOcust 3-3215
TELEWRITER PH 636

*Contract Carriers • Inland Waterways*

# By every standard... WEST END MEASURES UP AS THE QUALIFIED SUPPLIER OF SODA ASH


• ACCURATE PROCESSING OF ORDERS
• UNIFORMLY HIGH QUALITY
• ABUNDANT STORAGE
• FLEXIBLE AND EFFICIENT LOADING AND SHIPPING
• EXTENSIVE PRODUCTION CAPACITY
• VAST NATURAL SOURCE OF RAW MATERIAL
• ALL COMMITMENTS SCRUPULOUSLY MET
• FRIENDLY, HELPFUL ATTENTION TO INDIVIDUAL NEEDS
• PROMPT, AUTHORITATIVE ANSWER TO EVERY INQUIRY
However you view your needs, you will find in West End a unique coordination of specialized services, extensive production facilities and product excellence essential to the prompt, efficient handling of individual requirements.

## *Extensive production capacity*



At work around the clock for 35 years, the constantly enlarging facilities at West End supply immediate requirements and maintain vast reserves. Production is geared to meet all normal and emergency requirements of our customers promptly, regardless of market conditions.

Stauffer CHEMICALS SINCE 1885 — 75 YEARS OF SERVICE TO INDUSTRY AND AGRICULTURE

**WEST END CHEMICAL COMPANY • DIVISION OF STAUFFER CHEMICAL COMPANY**

1956 WEBSTER STREET, OAKLAND 12, CALIF. • PLANT: WESTEND, CALIF.

# Ethers of Hydroquinone

Here are two exciting new chemicals from Ansul. H.A. has been effective in stabilizing chlorinated hydrocarbons, motor fuel, rubber . . . as a non-staining anti-oxidant and valuable intermediate. The sun-screening properties of D.M.B. offer possibilities as a weathering agent in paints, lacquers, plastics and in sun-tan lotions and creams. Its sweet-clover odor may suggest use in cosmetic formulations. We will also be glad to send you our latest technical bulletins or samples of these promising chemicals.

ANSUL

REFRIGERATION PRODUCTS
FIRE FIGHTING EQUIPMENT
INDUSTRIAL CHEMICALS

| Physical Properties Compound | H. A. para Methyoxy Phenol | D. M. B. para Dimethoxy Benzene |
|---|---|---|
| Chemical Formula | $CH_3OC_6H_4OH$ | $C_6H_4(OCH_3)_2$ |
| Molecular Weight | 124.13 | 138.16 |
| Boiling Point °C | | |
| 760 mm. Hg. | 243° | 213° |
| 100 mm. Hg. | 175° | 140° |
| 50 mm. Hg. | 160° | 123° |
| 10 mm. Hg. | 126° | 89° |
| Melting Point °C | 53° | 56° |
| Density gms./ml. (65°C) | 1.1106 | 1.0293 |
| Solubility (25°C in gms./100 gms. solvent) | | |
| Water | 4.1 | Insoluble |
| Benzene | 69.5 | 177.0 |
| Acetone | 426.0 | 233.0 |
| Ethyl Acetate | 245.0 | 150.0 |
| Alcohol | 456.0 | 33.3 |
| Color | Tan to white | White |
| Odor | Characteristic | Sweet Clover |

ANSUL CHEMICAL COMPANY • MARINETTE, WISCONSIN


## SPECIALTIES

under the trademark, Goop. Silver Goop is said to prevent seizing regardless of the applied load on threaded parts; Blue Goop is an antiseize and sealing compound for use on titanium, stainless steel, steel, etc.; and High Purity Goop is suggested when prevention of product contamination is essential.

•

**Epoxy Curer:** Epotuf hardeners 2611 and 2613 for room temperature curing of epoxy resins are being offered by Reichhold Chemicals, Inc. (White Plains, N.Y.). Reichhold says epoxy resins that normally would yield rigid cured products are flexible and resilient when cured with its new products.

•

**Alkaline Deruster:** A new derusting compound for alkaline plating lines is being marketed by Cowles Chemical Co. (7016 Euclid Ave., Cleveland). Rustnix is said to sequester rust without attacking the metal, produce smut-free surfaces. The product is packed in individually boxed, 50-lb. porous blocks, and is wrapped in polyethylene so it can be handled without gloves.

•

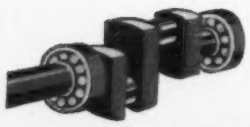
**Aerosol Weed Killer:** Target, an aerosol weed killer, is now being distributed nationally by DeMert & Dougherty, Inc. (5000 W. 41st St., Chicago). A 16-oz. can, retailing for 98¢, is said to kill 2,000 lawn weeds. Target is formulated to kill most broad leaf weeds and many woody plants, poison ivy, ragweed and wild onion. A white tracer is left on the weed so that the user can see what he hits.

•

**Cost-Reducing Rodenticide:** Inland Chemical Corp. (New York) has a new, patented formulation of a water-soluble anticoagulant rodenticide —Incco 86—claimed to reduce formulation costs considerably. The product comes ready to use, does not separate in solution, is mould- and insect-resistant, and dissolves in soft or hard water. Price in 100-lb. quantities: $1.44/lb., freight paid.

•

**Leveling Agent:** American Cyanamid Co. (New York) has brought out a new leveling agent—Calco Leveling Salt LV—said to give deeper and more solidly dyed shades on wool or nylon with neutral dyes.

ANSWER
to Worthington "Hidden Value" Puzzle on Page 63

The fictitious "hidden value" is *Adjustable Roller Main Bearings*. The design of any balance opposed compressor makes roller bearings impractical from a maintenance standpoint. Worthington balanced opposed compressors use centrifugally cast sleeve bearings which can be removed for inspection or maintenance without disturbing the crankshaft or removing the connecting rod from the frame.

NOW

ALKYL CHLORIDES

$C_6$ - $C_{22}$

with these highly desirable properties:

- WATER WHITE
- HIGH PURITY
- FREE from Starting Alcohol
- Especially suitable for MET-ALLO-ORGANIC compounds

*Pilot scale quantities now available.*

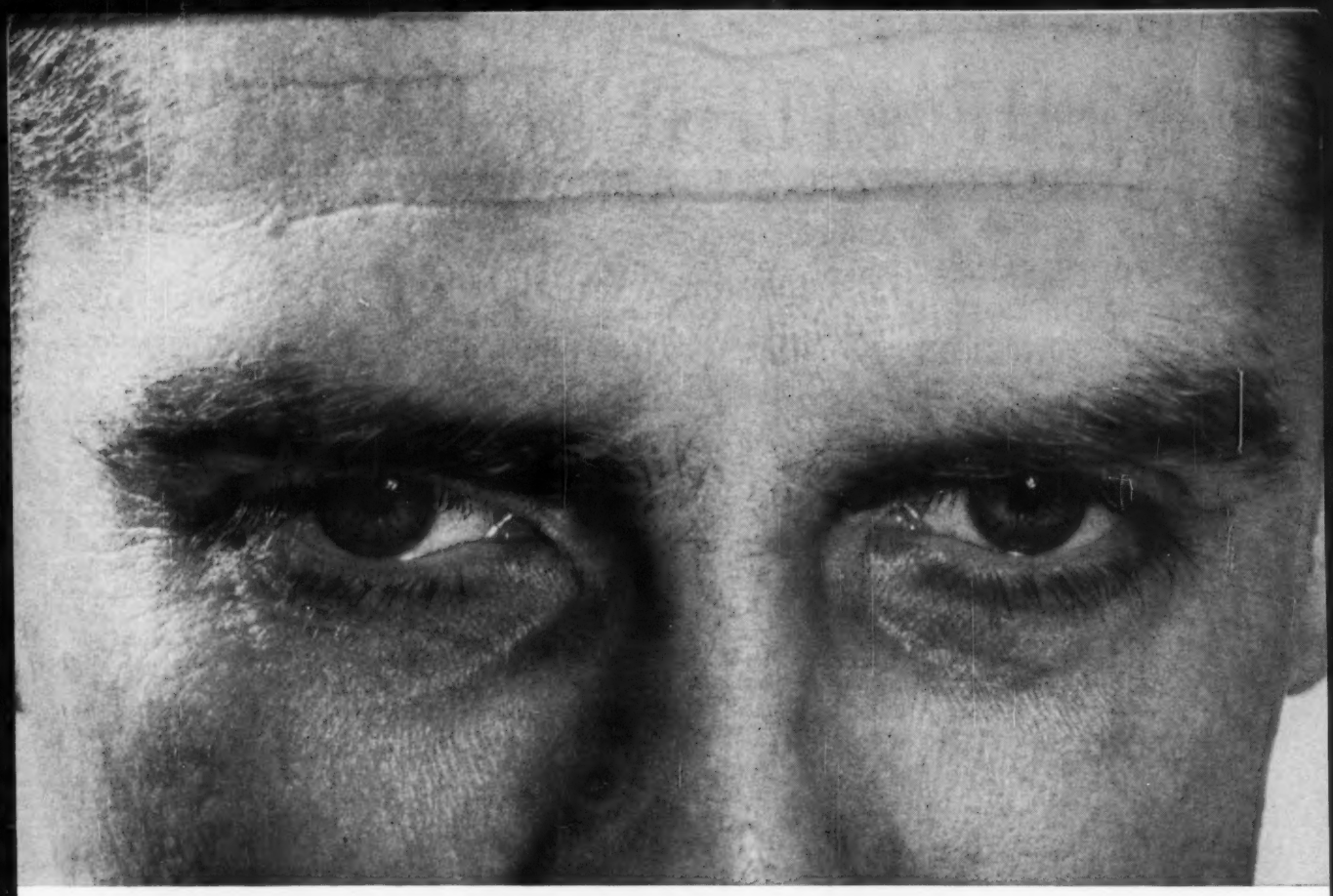
PHONE, WIRE or WRITE TODAY

HUMPHREY-WILKINSON, Inc.

Since 1947

*Serving the Blue Book of Industry with Intermediates and Research Chemicals*

201 Devine St., NORTH HAVEN, CONN.



# Take a Closer Look at Tripoly

If you can increase the Sodium Tripolyphosphate content of your synthetic detergents it will pay you to do it. Tripoly steps up the cleaning power of the components in your formulation, especially the wetting agents. Yet it costs less than those synthetics it replaces. The saving lets you formulate a better balanced detergent since you don't need to employ harsh alkalis to offset a high wetting-agent cost. The improvement shows up in your sales.

Blockson Tripoly is outstanding in its ability to control hard water. Its strong buffering action assures solution stability and it works easily into a wide range of formulations from dish and laundry detergents to floor, wall and metal cleaners. May we send you a data sheet or sample?

BLOCKSON

**BLOCKSON CHEMICAL COMPANY**

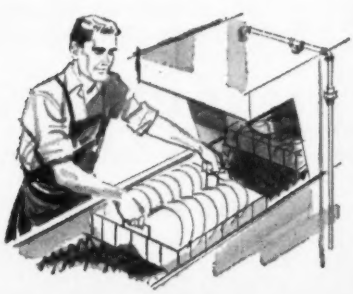
*Chemicals Division*

*Olin Mathieson Chemical Corp.*

*Joliet, Ill.*

**TRIPOLY THE SYNERGIST**

In dishwashing compounds, Tripoly's synergistic action boosts the detergency of the components and speeds grease removal. Enhances the free rinsing sparkle your formulation imparts to glassware.

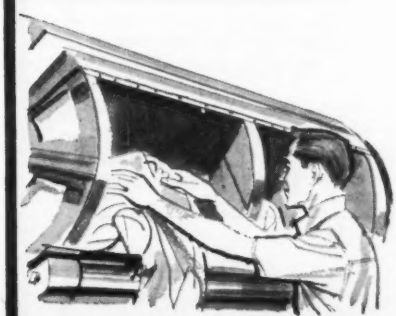


**—THE SEQUESTRANT**

In washing machine compounds, Tripoly sequesters the hardness elements. No insoluble precipitates adhere to fabrics or machine. Tops, too, for all non-ionic based controlled-suds detergents.

**—THE PEPTIZER**

In laundry compounds, Tripoly peptizes soils into a stable suspension that helps prevent redeposition on the wash. Result: whiter clothes, shorter wash cycle, less wear and tear on the fabrics.



# THE LITHIUM REACTOR

CURRENT INFORMATION ON LITHIUM CHEMISTRY AND METALLURGY

## LITHIUM SALTS PLAY MAJOR ROLE IN AIR CONDITIONING

*Chloride and Bromide Widely Used in Air Cooling and Dehumidification*

Anticipating summer's high demands, air conditioning experts all over the United States are now busily overhauling equipment, checking systems, and ordering spare parts. Although many receive the benefits of air conditioning, few people realize the important part played by lithium chemicals in making such systems effective. Because of their hygroscopicity, solutions of lithium bromide and lithium chloride are used by some of the major manufacturers of air-conditioning equipment to provide not only cooling but also dehumidification. Arkla, Carrier, and York have found lithium bromide solutions to be the ideal absorbent for water vapor in their absorption-type refrigerating equipment.

Lithium chloride solution is the preferred chemical in the "Kathabar" unit of Surface Combustion Company, which is used for the dehumidification of air. When the air being treated passes through a Li Cl spray, it is not only dehumidified but sterilized as well! Neither filters or ultraviolet lamps are needed to assure air free from microorganisms for hospitals, food and pharmaceutical plants, etc., according to the manufacturer.

## Lithium Catalyst Vital to Production of New Synthetic "Natural" Rubber

### Isoprene Polymers Using Butyllithium Catalysts Compare Favorably With Natural Material

Newest story in the rubber industry is synthetic "natural" rubber, first reported in 1955. Based upon the same monomer, isoprene, that is the building block for natural rubber, the new synthetic duplicates natural, or Hevea, rubber to a surprising degree and is expected to replace SBR-types in substantial amounts.

Polymerization techniques for isoprene rubber (cis-1, 4-polyisoprene) differ widely from conventional systems for making SBR. The latter is formed in an emulsion system to provide the optimum properties. Not so with isoprene rubber, which is made directly from the isoprene monomer with *n*-butyllithium and lithium dispersions among the preferred catalysts. LCA, working with interested companies, has developed a very pure *n*-butyllithium for this process. Free from such polymerization inhibitors as copper and other heavy metals, and free also from any traces of residual *n*-butyl halide which will cause white precipitates to form on standing, this catalyst strongly favors the formation of cis-1, 4 structures similar to Hevea.

#### *Similarity of Structure and Chemistry*

Proof of almost unbelievable similarity to rubber has been established for the cis-1, 4 polyisoprene material. For example: this synthetic has molecular weights similar to and even above the best grade of natural rubber—infrared spectroscopic analysis shows Hevea and this synthetic to have like molecular arrangements—further striking similarity is indicated through the X-ray diffraction pattern characteristics.

#### *Performance Comparisons*

After normal processing, the new material produces smoothly calendered sheets of excellent tack. The tensile strength of its gum stocks approaches and often overlaps that of natural rubber...a great improvement over presently available synthetics. Further similarity to Hevea is indicated by low hysterisis and retention of properties at high temperatures (212°–275° F). This latter property alone indicates its desirability for truck tires where heat build-up has been a factor.

Commercial quantities of this new synthetic natural rubber are expected to become available late this year with Shell Oil the first plant to be on stream.

### LITHIUM IN BRIEF

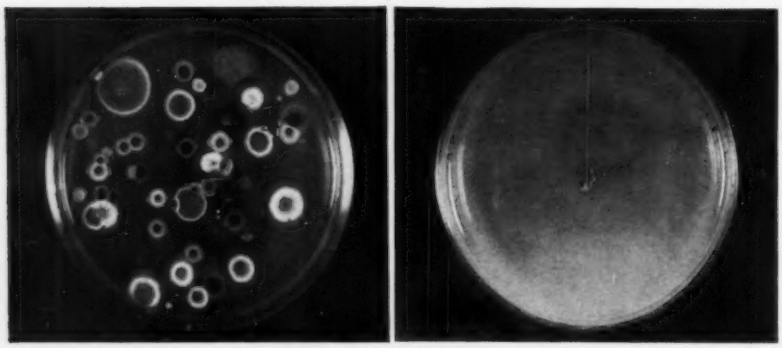
*For further information, write our Technical Service Department.*

A complete bibliography and review of the literature on molten lithium carbonate has been prepared. (1918-9).

A recent patent claims the use of $Li_2O$ to minimize the tendency for gas bubbles to form at this interface of porous ceramic body and silicate glass. (1980).

Recently published studies on the reaction of phenol and formaldehyde compare lithium hydroxide to other metal hydroxides on the ortho/para ratio of hydroxymethylphenol prepared by base catalysts. (1766).

Liquid lithium, dispersed in an inert hydrocarbon, reacts with nitrogen to form $Li_3N$. (1753).



*Photographs of cultures made from (left) the condensing water from a standard refrigerating system and (right) one from the lithium chloride solution in a "Kathabar" unit. Effectiveness of this salt is shown by the complete absence of microorganisms in the culture.*

LITHIUM CORPORATION OF AMERICA, INC.
TITLE INSURANCE BUILDING • MINNEAPOLIS 1, MINN.
NEW YORK 17, N.Y. • CLEVELAND 14, OHIO • CHICAGO 1, ILL. • LOS ANGELES 36, CALIF. • BESSEMER CITY, N.C.

# Market Newsletter

CHEMICAL WEEK
April 2, 1960

**Phthalate plasticizer buyers won't be hit by higher tabs** April 1, despite price hikes already posted by some major producers (*CW Market Newsletters, March 12 and 26*). Reason for the general retreat, observers say: "Industry didn't go along with the price increases; hence, competition forces adherence to the lower price levels." Some observers attribute this to differences in the raw-material status. Firms basic in alcohols don't feel the need of plasticizer price increases as much as do producers who are basic in phthalic anhydride and must pay higher prices for naphthalene.

First tangible evidence of a split on pricing policy came last week when Kay-Fries balked at hiking plasticizer tabs. When other producers, e.g., Union Carbide—made no moves to increase prices, Allied, Monsanto and Eastman Chemical took down their higher quotes—or indicated they would do so if the market showed signs of stabilizing at the lower prices.

•

**Soda ash prices will remain steady,** despite Columbia-Southern's recent attempt to boost tabs by $2.50 across the board (*CW Market Newsletter, March 5*). Although reaffirming its conviction that increased production costs justify a price hike, C-S spokesmen say that reluctance of others to go along with higher tabs forces C-S to rescind its price advances "for competitive reasons."

Soda ash supplies are characterized as "in good balance—neither excessively loose nor tight."

Prices will remain at $31/ton and $37/ton, respectively, for bulk and 100-lb. paper bags of light and medium soda ash. Dense soda ash will stay at $32 and $38/ton in bulk and bags, respectively.

•

**A 10-million-lbs. order for 75% wettable DDT powder** went to Montrose Chemical of California—lowest bidder for a contract put up by UNICEF (United International Children's Emergency Fund). Selling price is 22.22¢/lb.; delivery will be between April and December. Last year a substantially bigger order, totaling more than 46 million lbs., was split among 10 DDT producers; but Montrose at that time, too, picked up by far the biggest share.

UNICEF says bids for additional quantities might be invited in September or October if supply requirements warrant; on the other hand, new supplies may not be sought until next spring. Earliest hint of future requirements probably won't come until sometime in August.

•

**Startup of polyester resin and film production** at Eastman Kodak's new facilities at Rochester, N.Y., points up the growing photographic market for polyester products. Polyester film base is aimed at graphic arts materials in which dimensional stability is of special importance.

General Aniline & Film's Ansco Division recently revealed it would also make polyester film base for graphic arts products (*CW Market Newsletter, Feb. 27*); however, Ansco won't make its own resin, instead will buy from General Electric.

•

**All aluminum produced by Aluminum Co. of Canada's** 38,000-tons/year smelter at Beauharnois, Que., will probably be absorbed by Chrysler Corp. of Canada and its U.S. parent company. The U.S. firm reportedly will need about 35,000 tons/year of the metal for its Valiant Division. The Beauharnois smelter is leased to Chrysium Ltd. (owned 51% by Chrysler, 49% by Alcan).

•

**Aluminum Co. of America is boosting plant capacity** of its Warrick, Ind., smelter (now under construction) by 25,000 tons—to 175,000 tons/year. The hike results from redesign rather than because of addition of more potlines. First of five potlines is scheduled to go on-stream June 1.

•

**Fluorocarbon fiber capacity has been increased** at Du Pont's Spruance plant at Richmond, Va. Reason behind the move: the growing market for the fiber (as well as woven fabric and nonwoven felts made from the fiber) in seals, packing, filtration, diaphragms, gaskets, bearings.

The move is another step in Du Pont's efforts to expand the markets for its Teflon fluorocarbon resins (*CW, Jan. 16, p. 65*).

•

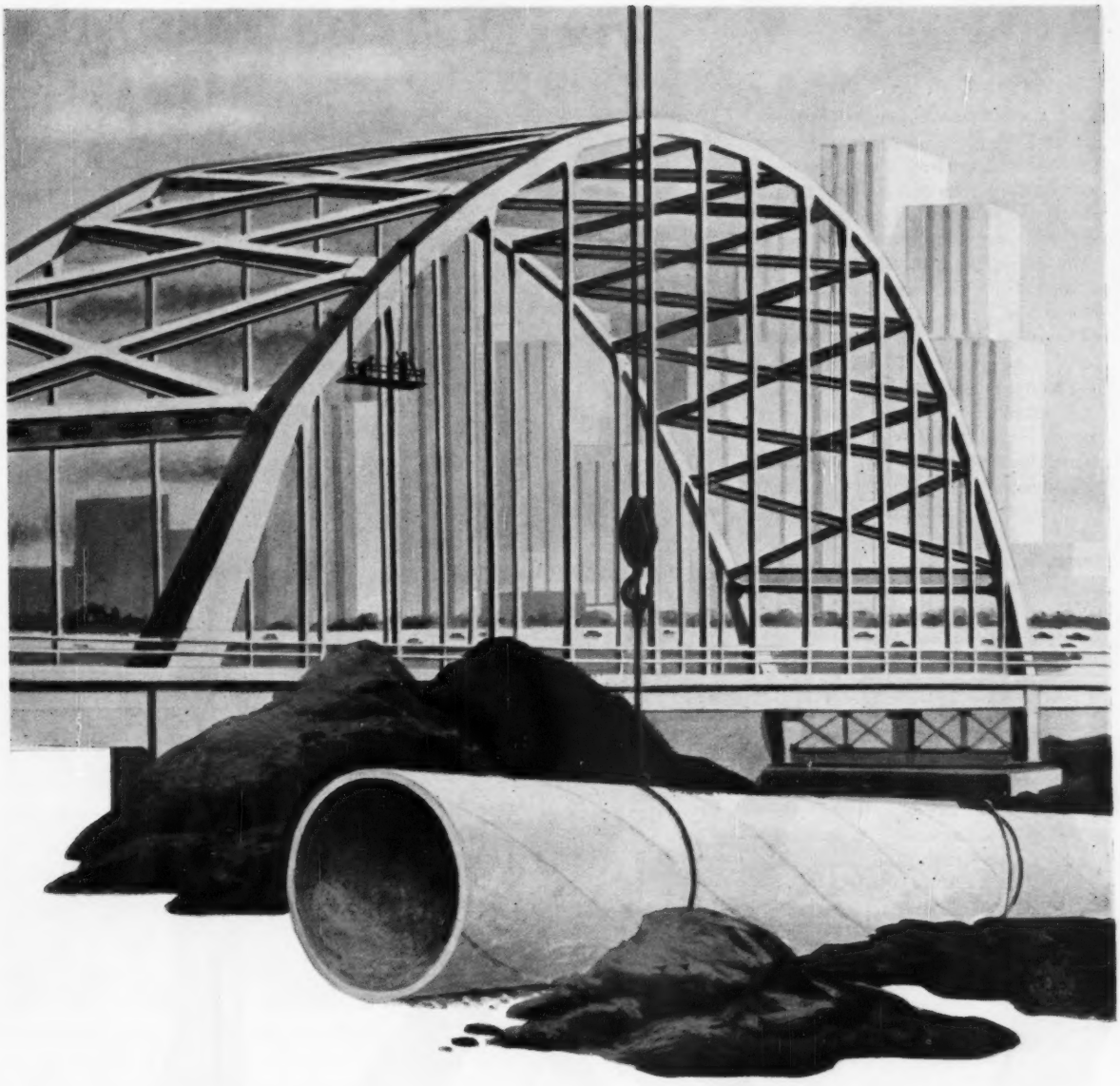
**Two new transportation equipment developments:** Canadian National Railways and the Roberval and Saguenay Railways shortly will put into service a new-design aluminum tank-hopper car expected to be suitable for most products now handled in steel covered hopper cars. The Aluminium Ltd. (Montreal) cars—nine of which are expected to do the work of 10 steel cars—have a gross weight of 210,000 lbs., capacity of 179,000 lbs. (3,000 cu. ft.).

The U. S. Air Force has just put into operation four 7,000-gal. liquid-hydrogen tank trailers for cross-country use. Each trailer's highly insulated inner chamber holds 2 tons of the liquid. Air Products, Inc. (Allentown, Pa.), designed and built the trailers.

**SELECTED PRICE CHANGES—WEEK ENDING MARCH 28, 1960**

| | Change | New Price |
|---|---|---|
| **UP** | | |
| Antimony oxide., bgs., c.l. | $0.02 | $0.265 |
| Citronella oil, Ceylon, dms. | 0.05 | 1.00 |
| **DOWN** | | |
| Platinum metal, oz. | $1.00 | $81.00 |
| Tin metal (Straits) | 0.01 | 1.00 |

**All prices per pound unless quantity is quoted.**



# Piccolastic

## bonded strength

Piccolastic Resins are thermoplastic polymers of selected styrene. Available in many grades from plastic liquids in the plasticizer class to hard and tough high melting point grades.

Piccolastic Resins are inert and neutral, with excellent water and chemical resistance and are used wherever pale color, strength, and protection are desired.

*The trademark of quality*

**PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION**
**CLAIRTON, PENNSYLVANIA**

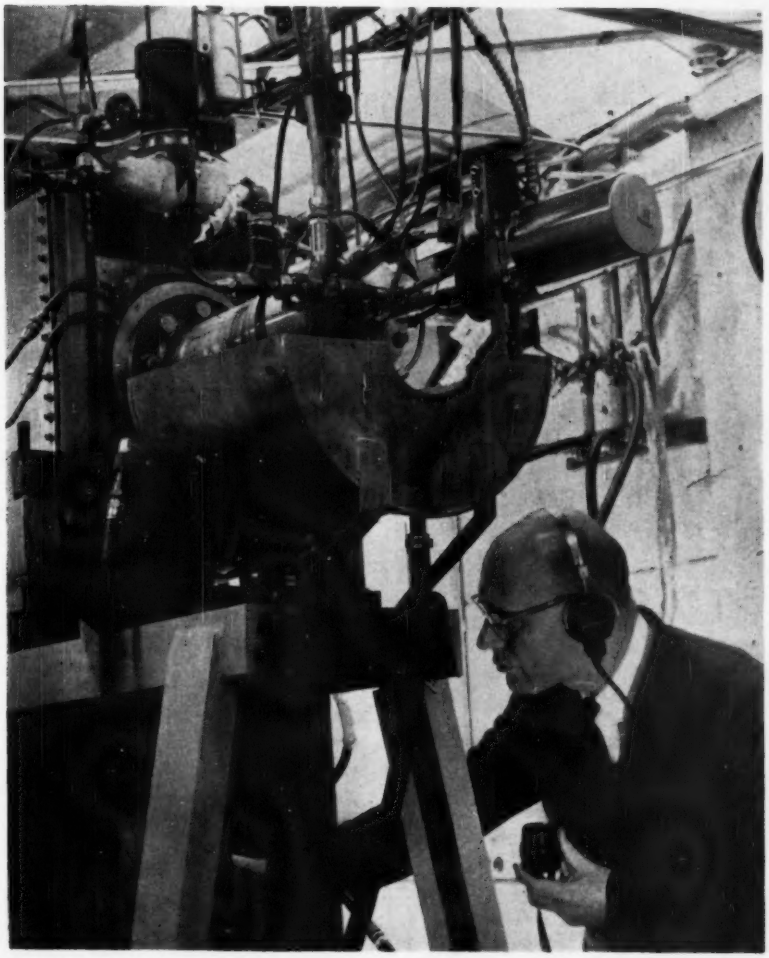
**experience** (eks pē′ri ens) n. Skill or wisdom gained by actually doing things. Knowledge gained by trial and practice. v.t. To undergo; to know or learn through one's own actions.

Doing is experience. Vitro has already designed **two billion dollars** worth of facilities...whose usefulness has been expanded by the early application of new engineering techniques. This experience assures you an on-time facility—and profitable design which remains competitive for years to come. Find out today how this background can be put to work for you.

*engineering the future*

**Vitro ENGINEERING COMPANY**

225 PARK AVENUE SOUTH, NEW YORK 3, N. Y. • A DIVISION OF VITRO CORPORATION OF AMERICA



**Westinghouse unit makes electricity from chemically 'seeded' oil.**

# Power Plants Seek CPI Aid

**Magnetohydrodynamic power generators, like Westinghouse's 10-kilowatt lab unit (above), fuel cells, thermoelectric devices and thermionic systems are being groomed as long-range successors to conventional electric power plants. For the chemical industry, sitting in at this week's American Power Conference in Chicago, the new devices hint at substantial markets for the still-uncommon chemicals that are essential to generator operation.**

Although these novel devices are still pretty far from commercial use, prototypes are already going into special projects such as space vehicles. And considerable research and development effort is being spent by such major power equipment makers as Allis-Chalmers, General Electric, and Westinghouse—attesting to their confidence in the long-range prospects of direct conversion of heat into electricity.

The chemical process industries have also become aware of several challenging opportunities stemming from the new devices' special requirements for fuels and materials of construction.

Fuel cells, for example, are being developed along several lines (*CW, July 25, '59, p. 45*), each of which requires special anode materials, electrolyte and, in the case of regenerative fuel cells, chemical reactants capable of converting reaction products back into reusable fuel.

**Temperature Barrier:** Thermoelectric generating systems, which operate on the same principle as the more familiar thermocouple, are also dependent on special materials. Existing thermoelectric materials, while suitable for certain special uses such as the SNAP III device developed by The Martin Co. (*CW, March 21, '59, p. 92*), still fall short of economical, commercial operating efficiency.

Nonetheless, researchers appear confident that current development projects will break the thermoelectric barriers. Westinghouse reports it is "nearing completion" of a small-scale, 5,000-watt thermoelectric generator prototype for a Navy shipboard installation; is also working on a portable 500-watt back pack for military personnel. The company's final goal: a 1,000-kw. thermoelectric power plant by the mid-'60s.

Minnesota Mining and Manufacturing Co. is also working on a portable (35-lbs.), 500-watt thermoelectric generator to be fueled with propane, kerosene or other common hydrocarbon fuels. And Robert Fritts, manager of 3M's thermoelectric project, predicts that larger-scale uses, such as conversion of nuclear heat to power in atomic submarines, is entirely feasible with thermoelectric materials now available.

Also on the threshold of commercialization are several industrial and household uses for thermoelectric conversion of waste heat, Fritts told CHEMICAL WEEK. For example, a gas transmission company is now considering a small generator fueled with gas drawn from pipelines. It could be used to provide current for galvanic protection of the line.

Possible household uses include: (1) a device operating on waste heat from home hot-water and heating systems to generate the electricity required for auxiliary equipment, such as blowers, control valves; (2) a dual-purpose device—in effect, a heat pump—using thermoelectric effects to take heat out of water vapor in a dehumidifier and transfer it into the hot-water heating system.

**Chemical Key:** A major goal of current thermoelectric research is the development of materials that can

NSD Symbol of Quality

NEWARK STEEL DRUM CO. INC.
LINDEN, NEW JERSEY

Manufacturers of
NEW AND RECONDITIONED STEEL DRUMS

SURFACE ACTIVE AGENTS

Tergitol® Brand
Nonionic and
Anionics

GLYCOLS
GLYCOL ETHERS
CHLORINATED SOLVENTS
KETONES • ESTERS • AMINES
PLASTICIZERS • AROMATIC SOLVENTS
SURFACE ACTIVE AGENTS • ALCOHOLS
ALIPHATIC NAPHTHAS • POLYETHYLENE GLYCOLS

CS CHEMICAL SOLVENTS, INC.
60 PARK PLACE, NEWARK 2, N. J.
WOrth 2-7763 (N.Y.) MArket 2-3650 (N.J.)



produce current efficiently at high temperatures. Fritts suggested that the best candidates are chemical compounds of extremely stable species, having complex structures (not binary mixtures) that are not easily thermally degraded. ZM's thermoelectric elements have largely been based on lead telluride, although Fritts hinted that combinations of lead telluride with lead selenide produce a "rather interesting material."

Other compounds under consideration include metallic nitrides and silicides, semiconducting organics and certain boron chemicals. Stephen Angello, manager of Westinghouse's thermoelectricity project, cited work on nickel oxide modified by the addition of 3% lithium as typical of the approach being taken to attain higher-temperature operation. This approach led to samarium sulfide, one of the newest mixed-valence materials, efficient at temperatures as high as 1100 C, said Angello.

**Plasma Problem:** Materials of construction are an even more important consideration in MHD generators, which operate at even hotter temperatures (4000-5000 F). Laboratory MHD systems, operated for only seconds or minutes at a time, clearly indicate need for greatly improved refractories capable of withstanding high temperatures, sudden temperature changes and chemical interaction with the gas plasma employed.

MHD generators will also require chemical fuel additives — compounds that are ionized at the operating temperature to make the hot gas electrically conductive. In the initial demonstration of an oil-fueled MHD generator (*CW Technology Newsletter, March 26*), Westinghouse used common furnace oil "seeded" with potassium soap. Avco-Everett Research Laboratory (Everett, Mass.) has used an electric arc plasma in research tests, says chemical additives will be required for a coal-fueled MHD system now in the works. Such systems will likely find initial application as "topping units" in combination with conventional plants, which can utilize the heat remaining in the exhaust gas plasma.

Whatever their future role in commercial power production may be, these unconventional generating systems will require a big assist from the CPI.

## Drawing by Camera

**In St. Louis last week engineering managers heard how Monsanto uses photo-drafting techniques to bypass time-consuming hand-drafting work. A step-by-step analysis of photo-drafting, along with costs and estimates of engineering and construction man-hours saved, was presented at a local AIChE seminar by W. A. Kuhn and W. F. Taffee.**

Describing Monsanto's experience, Kuhn and Taffee estimate that a project using photo-drafting requires 10-20% less time than a project based solely on engineering drawings.

"The reason," says Taffee, "is that the craftsman does not have to translate the image he sees on a drawing to what the physical installation actually looks like." The cost of the photographic transparencies used by Monsanto was shown to be $3.70 per photo—less than the cost of one hour's drafting work.

Engineering drawings are simply a means of communication between engineering designers—who establish the size, shape and dimensions of new installations—and field personnel—who put the new equipment into place at the plant site.

However, the customary use of drawing scales, drafting symbols, and precise dimensions have made engineering drawings a type of code that requires two sets of specialists: one to translate the engineers' specifications into drawing form, and another to decode the drawings for the field installation.

Drawings have grown more and more complex as process plants have grown more intricate. The effort required to translate engineering designs into drawings, prepare the drawings, and then retranslate them into physical equipment often requires more man-hours than does the engineering and construction supervision work involved.

To avoid this, engineers turn to visual means of communication. For new plants, models serve this purpose; for revisions or additions to existing plants, photo-drafting is finding increasing use. The procedure for using this design-and-construction timesaver is described in six steps:

(1) Prepare a layout drawing covering the area of the revision and showing the existing equipment; in addition, for orientation, draw in


How United States Testing Company helps

# STOP TROUBLE BEFORE IT STARTS

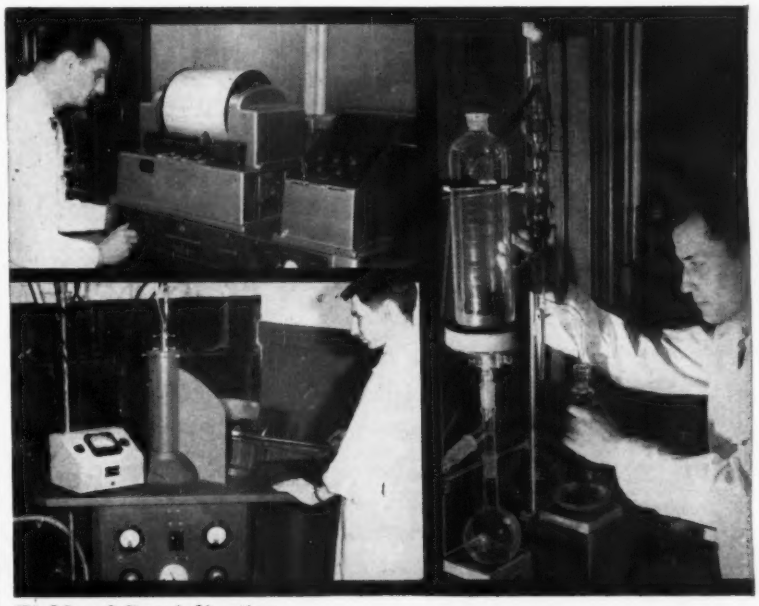
Spotting potential trouble in processes or products...and saving thousands of dollars in damages and lost production... that's only one of many services United States Testing Company offers you.

Take the beverage manufacturer concerned about the strength of his bottles. We selected a large sample—old, new, small, large, filled, and empty ...inspected each for bad scratches, bubbles, striations, and chips... polariscoped to spot internal strain... hydrostatic tested for bursting strength ...and immersed in hot, then icy water to measure thermal shock resistance.

Result: A "spectrum" of data showing exactly his safety and potential danger areas.

Knowing how to induce failure in the laboratory and prevent trouble in the process or field calls for trained evaluation engineers and diversified facilities. You get both at United States Testing Company. Why not phone or write us about your plant problem?

13



**Fields of Specialization:**

Water Analysis • Pharmaceuticals & Drugs • Chemicals & Natural Raw Materials • Fuels & Oils
Pulp & Paper • Textile Chemicals & Dyes • Paints, Varnishes & Pigments • Soaps & Detergents
Food Products & Additives • Resins, Plastics & Rubber • Physical Chemistry • Metals Chemistry
Microbiology • Plant & Site Inspections • Outdoor Exposures • Agricultural Chemicals & Soils Analysis

*Send for free bulletin describing our evaluation and R/D services*

*The World's Most Diversified Independent Laboratory.*

**United States Testing Co., Inc.**
1415 Park Avenue, Hoboken, N. J.

**Branch Laboratories** | BOSTON • BROWNSVILLE • DALLAS • DENVER • LOS ANGELES MEMPHIS • NEW YORK • PHILADELPHIA • TULSA

# CHEMICAL WEEK • ADVERTISERS' INDEX

## April 2, 1960


*ALLIED CHEMICAL CORP., BAKER & ADAMSON DIV. ..... 3rd Cover
Agency—Kastor, Hilton, Chesley, Clifford & Atherton, Inc.

*ALLIED CHEMICAL CORP., NITROGEN DIV. ..... 4
Agency—G. M. Basford Co.

*ALLIED CHEMICAL CORP., SEMET-SOLVAY PETROCHEMICAL DIV. ..... 17
Agency—Benton & Bowles, Inc.

*ALLIED CHEMICAL CORP., SOLVAY PROCESS DIV. ..... 53
Agency—Kastor, Hilton, Chesley, Clifford & Atherton, Inc.

AMERICAN CAN CO. ..... 22
Agency—Compton Adv., Inc.

AMERICAN MINERAL SPIRITS CO. ..... 57
Agency—Leo Burnett Co., Inc.

ANSUL CHEMICAL CO. ..... 72
Agency—The Brady Co.

BALTIMORE & OHIO RAILROAD ..... 45
Agency—Richard A. Foley Adv.

BARNSTEAD STILL & STERILIZER CO. . 7
Agency—Copley Adv., Agency, Inc.

*BENZOL PRODUCTS CO. ..... 57
Agency—The House of J. Hayden Twiss, Inc.

BLOCKSON CHEMICAL CO. ..... 73
Agency—Wm. Balsam Adv.

BZURA CHEMICAL CO., INC. ..... 25
Agency—Ray Ellis Adv., Inc.

CATALYTIC CONSTRUCTION CO. ..... 20
Agency—Doremus-Eshleman Co.

CENTURY CHEMICAL CORP. ..... 68
Agency—G. M. Basford Co.

*CHASE BAG CO. ..... 11
Agency—Hazard Adv. Co.

CHATTEM CHEMICALS ..... 68
Agency—Lookout Adv. Agency

CHEMICAL BARGE LINES, INC. ..... 70

CHEMICAL CONSTRUCTION CORP. ..... 59
Agency—Van Brunt & Co.

CHEMICAL SOLVENTS, INC. ..... 80
Agency—Asher, Godfrey & Franklin, Inc.

CIBA PRODUCTS CORP. ..... 26
Agency—Briggs & Varley Inc.

*COLTON CHEMICAL CO., A DIV. OF AIR REDUCTION CO., INC. ..... 48
Agency—The W. N. Gates Co.

CROWN CORK & SEAL CO. ..... 60
Agency—Aitkin-Kynett Co. Adv.

DISTILLATION PRODUCTS INDUSTRIES, DIV. OF EASTMAN KODAK CO. ..... 34
Agency—The Rumrill Co., Inc.

DURIRON CO., THE ..... 4th Cover
Agency—Odiorne Industrial Adv. Co.

*ENJAY CO., INC. ..... 47
Agency—McCann-Erickson, Inc.

ETHYL CORP. ..... 2
Agency—Reach, McClinton & Co., Inc.

FLUOR CORP. ..... 64-65
Agency—Foote, Cone & Belding

FRONTIER CHEMICAL CO. ..... 6
Agency—The McCormick-Armstrong Co.

GAYLORD CONTAINER CORP., DIV. OF CROWN ZELLERBACH CORP. ..... 69
Agency—French Advertising, Inc.

GENERAL AMERICAN TRANSPORTATION CORP. ..... 18, 28
Agency—Edward H. Weiss & Co.

HALL CO., THE C. P. ..... 56
Agency—Cruttenden Adv.

HERCULES POWDER CO. ..... 12
Agency—Fuller & Smith & Ross, Inc.

*HUMPHREY WILKINSON, INC. ..... 72
Agency—E. J. Lush, Inc.

IMPERIAL COLOR CHEMICAL & PAPER CORP. ..... 21
Agency—James R. Flanagan Adv. Agency

INTERNATIONAL BUSINESS MACHINES 38
Agency—Benton & Bowles, Inc.

*JEFFERSON CHEMICAL CO. ..... 8
Agency—Robinson-Gerard-McGary, Inc.

*LITHIUM CORP. OF AMERICA ..... 74
Agency—Hazard Adv. Co., Inc.

MALLINCKRODT CHEMICAL WORKS .. 19
Agency—H. George Bloch, Inc.

MARCO DEVELOPMENT CO. ..... 50
Agency—Gauge Assoc.

MINNESOTA DEPT. OF BUSINESS DEVELOPMENT ..... 68
Agency—Bozell & Jacobs, Inc.

MISSISSIPPI AGRICULTURAL & INDUSTRIAL BOARD ..... 70
Agency—Gordon Marks & Co. Inc.

MORTON SALT CO. ..... 41
Agency—Needham, Louis & Brorby, Inc.

NEPTUNE METER CO. ..... 58
Agency—W. L. Towne Adv.

NEWARK STEEL DRUM CO. ..... 80
Agency—Ira S. Kahn Co. Adv.

*NOPCO CHEMICAL CO. ..... 48
Agency—Gray & Rogers Adv.

NORTH AMERICAN CAR CORP. ..... 1
Agency—Roche Rickerd & Cleary Inc.

OWENS-ILLINOIS GLASS CO. ..... 42-43
Agency—J. Walter Thompson Co.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP. ..... 77
Agency—Downing Industrial Adv., Inc.

PROTECTIVE LINING CORP. ..... 30
Agency—Allan Rock Adv. Agency

REPUBLIC STEEL CORP. ..... 52
Agency—Meldrum & Fewsmith, Inc.

SHELL CHEMICAL CORP. ..... 44
Agency—J. Walter Thompson Co.

SPENCER CHEMICAL CO. ..... 54
Agency—Bruce B. Brewer & Co.

TEXAS BUTADIENE & CHEMICAL CORP. 56
Agency—Marsteller, Rickard, Gebhardt & Reed, Inc.

TEXAS GULF SULPHUR CO. ..... 36
Agency—Sanger Funnell, Inc.

*TRULAND CHEMICAL CO. ..... 56
Agency—Ray Ellis Advertising

U. S. TESTING CO. ..... 81
Agency—W. L. Towne Co., Inc.

UNION CARBIDE CHEMICALS CO., DIV. OF UNION CARBIDE CORP. ..... 29, 31, 33, 37, 39
Agency—J. M. Mathes Inc.

UNIVERSAL OIL PRODUCTS CO. ..... 66
Agency—Tobias O'Neill & Gallay, Inc.

*VIRGINIA-CAROLINA CHEMICAL CORP. 50
Agency—Albert Sidney Noble Adv.

*VITRO ENGINEERING CO. ..... 78
Agency—Sam J. Gallay Adv.

WEST END CHEMICAL CO. ..... 71
Agency—Norton M. Jacobs Adv. Agency

WORKLON, INC. ..... 70
Agency—Arpadi-Sarett Assoc.

WORTHINGTON CORP. ..... 63, 72
Agency—Needham, Louis & Brorby, Inc.

*WYANDOTTE CHEMICALS CO. ..... 32
Agency—Brooke Smith French & Dorrance, Inc.


tracers SECTION

(Classified Advertising)

F. J. Eberle, Business Mgr.


BUSINESS OPPORTUNITIES ..... 83

CONTRACT WORK WANTED ..... 83

CHEMICALS: Offered/Wanted ..... 83

EMPLOYMENT ..... 83

EQUIPMENT: Used/Surplus New For Sale ..... 83

SELLING OPPORTUNITIES Offered/Wanted ..... 83


## ADVERTISING STAFF


**Atlanta 3** ..... Michael Miller, 1301 Rhodes-Haverty Bldg., JAckson 3-6951

**Boston 16** ..... Paul F. McPherson, 350 Park Square Building, HUbbard 2-7160

**Chicago 11** ..... Alfred D. Becker, Jr., R. J. Claussen, 520 N. Michigan Ave., MOhawk 4-5800

**Cleveland 13** ..... H. J. Sweger, Duncan C. Stephens, 1164 Illuminating Bldg., 55 Public Square, SUperior 1-7000

**Dallas 1** ..... Gene Holland, Gordon Jones, The Vaughn Bldg., 1712 Commerce St., Riverside 7-5117

**Denver 2** ..... J. Patten, 1740 Broadway, ALpine 5-2981

**Detroit 26** ..... H. J. Sweger, Jr., 856 Penobscot Bldg., WOodward 2-1793

**Frankfurt/Main** ..... Stanley Kimes, 85 Westendstrasse, Germany

**Geneva** ..... Michael R. Zeynel 2 Place du Port, Geneva, Switz.

**London E.C. 4** ..... E. E. Schirmer, McGraw-Hill House, 95 Farringdon St., England

**Los Angeles 17** ..... Robert Yocom, 1125 West Sixth St., HUntley 2-5450

**New York 36** ..... Knox Armstrong, B. A. Johnson, P. E. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXford 5-5959

**Philadelphia 3** ..... William B. Hannum, Jr., 6 Penn Center Plaza, LOcust 8-4330

**Pittsburgh 22** ..... Duncan C. Stephens, Room 1111 Henry W. Oliver Bldg.,

**San Francisco 4** ..... William C. Woolston, 68 Post St., DOuglas 2-4600

**St. Louis 8** ..... R. J. Claussen, 3615 Olive St., Continental Bldg., JEfferson 5-4867


*For complete product data see catalog unit in the BUYERS' GUIDE ISSUE for 1959-60

an arrow fixing the compass points.

(2) After on-site studies with a professional photographer and a draftsman, mark the layout drawing with the areas to be photographed, directions in which the pictures should be taken, and key numbers for each picture.

(3) Take photographs and prepare transparencies that can be printed through drafting stock.

(4) Attach the transparencies to drafting stock, identify them with the layout drawings, and make prints.

(5) On the print, sketch in the proposed installation, freehand.

(6) Prepare a finished construction drawing from the freehand sketch. Since the lines printed from the photographic transparency will follow neither the right angles of a plane-view drawing nor the 30-90-120-degree angles of the conventional bird's-eye (isometric) drawing, new lines will have to be drawn parallel to those on the photograph.

Good photographic transparencies, says Kuhn, are essential to the final drawings. But anyone who has at his disposal a professional photographer, a normally equipped dark room, and a diazo printmaking machine has everything that is required. He recommends using a professional photographer to ensure that the transparencies have sufficient depth of field and contrast, and no blurring or shadow. Achieving effective use of lighting requires experience which the amateur doesn't have.

Once the photographer has taken the required pictures, he produces black-and-white contact prints and submits these to the project engineer. Using a grease pencil, the project engineer indicates the portion of each photo he wants enlarged. The marked-up contact prints are then used to make the transparencies (usually 11 x 14 in.) on a translucent film base.

Taffee points out two limitations: (1) flash equipment is a potential fire hazard and cannot be used near flammable materials; (2) long runs of straight pipe are best handled by conventional drafting techniques.

Monsanto's experience is part of a general trend to bypass the drafting board. Photo-drafting, with low cost and simplicity, bids to become the standard procedure for revising existing facilities.


# Tracers

TO THE CHEMICAL PROCESS INDUSTRIES

*Published: each Saturday—closes 11 days in advance.*

*Rate—$3.00 per line ($1.50 per line for position wanted ads), minimum 3 lines. Allow 5 average words as line; Count one half line for box number.*

*ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div of this publication. Send to office nearest you.*
*NEW YORK 36: P. O. BOX 12*
*CHICAGO 11: 520 N. Michigan Ave.*
*SAN FRANCISCO 4: 68 Post St.*

## POSITION VACANT

***Technical Service Engineer—BS in chemical*** engineering or chemistry with 3-5 years experience in the chemical industry. Some travel. Please send resume in confidence giving education, experience, and approximate salary to: Central Personnel Office Solvay Process Division, Allied Chemical Corporation, P.O. Box 271, Syracuse 1, New York.

## SELLING OPPORTUNITIES AVAILABLE

***Specialty equipment company requires manu-*** facturers representative. Should be in the 35 to 45 age range and presently handling similar accounts. Several territories open. Submit resume to RW-4099, Chemical Week.

***We represent foreign manufacturers in Heavy*** Chem, Pharmaceuticals and Fine Chem. and Dyestuffs. Interested in salesman working on a commission basis. RW-3993, Chemical Week.

## POSITIONS WANTED

***Petro-Chemical Supply Co-Ordinator — Experi-*** enced in negotiating process agreements and in all phases transportation. PW-4091, Chemical Week.

***Plant or Project Engineer—M.S. in M. E. Ten*** years in continuous process industries. Excellent supervisory experience in Plant Engineering, Construction and Maintenance. Seek challenging position. PW-3743, Chemical Week.

***Dr. in Chemistry, Organic Specialized in soaps,*** fats, vegetable oils, fatty acids & derivatives. 12 years experienced, research, product development and formulation. Desires responsible position. PW-4066, Chemical Week.

***Product, Market or Sales management oppor-*** tunity desired by successful mid-West Regional Manager, with broad bulk and specialty sales and marketing experience to most industrials. PW-4014, Chemical Week.

***Salesman, 37, outstanding order-getter, Chemi-*** cal degree, thorough knowledge of chemical industry, wants opportunity in small company. PW-3981, Chemical Week.

## SELLING OPPORTUNITY WANTED

***Do you need Sales Representation? Aggressive,*** intelligent and experienced sales group can handle a few additional lines in area between Conn. and N. Carolina. Have warehouse and offices in Newark, N. J. and eastern North Carolina. Commission basis. Confidences respected. RA-3914, Chemical Week.

***Sales agents wish to represent U.S. manufac-*** turers of chemicals. Commission Basis. We are well connected and established in Brazil and maintain permanent offices in Sao Paulo. RA-4095, Chemical Week.

***Manufacturer Agent Available—Detroit Area*** Distributor offers experienced sales representation by technically qualified men. Warehousing, tank storage, tank-car and box-car unloading, drumming facilities available and delivery. Write Deutser & Willihnganz, 615 E. Greendale—Detroit 3, Mich.

***A manufacturing and selling organization in*** the U.K., with strong connections in the restaurant and hotel trade throughout Europe, would welcome communications with a company in the U.S.A. who are manufacturing a 'Rinse Aid' Apparatus. RA-4035, Chemical Week.

## CONTRACT WORK WANTED

***Spray Drying—Reputable chemical manufacturer*** has modern spray dryer located in the Southeast available for custom drying, on volume basis, a wide variety of water soluble materials. Will consider drying solutions or slurries furnished by customer on toll basis. Also equipped to manufacture materials suitable for spray drying. If interested reply CWW-4094, Chemical Week.

***Custom Blending—Powders or Liquids.*** Your formulas or ours. Large or small runs. Quality Controls. CWW-4007, Chemical Week.

## PATENT RIGHTS

***Offered for Western Europe and United States*** for Continuous Processing Apparatus having the following features of interest to the Textile and Chemical Industries. 1. Treats yarns, tows, films, ropes, etc. while continuously running through the machine at speeds of up to and in excess of 1000 feet per minute. 2. Permits stretching and/or relaxing at will of continuously advancing material, with positive or negative tension adjustable without steps. 3. In spite of large linear yardage of material being processed on the machine at one time, the machine is very short and relatively simple. 4. Machine permits washing, drying, conditioning, curing, steaming, dyeing, bleaching and other wet and dry treatments. 5. Machine uses very little power, has few moving parts and runs at speeds which are one twentieth to one fiftieth of the linear speeds at which the material advances. Interested companies please write on your letterhead. No brokers, Box CW 1878, 125 W. 41 St., N.Y. 36, N.Y.

## BUSINESS OPPORTUNITY

***Chicago Bulk Chemical or Petroleum Storage*** site—River front location—Railroad spurs-Access to tollways—Will build to suit—Send for booklet—Hannah Terminals, Box 89, Lemont, Illinois, Chicago, BIshop 2-3210.

## FOR SALE

***Send for Revised Illustrated Circular on our*** $3,000,000 chemical plant liquidation at Orange, Texas. All T316 SS equipment including tanks, columns, heat exchangers, filters, centrifugals, pumps, valves, pipe, etc. Perry Equipment Corp., 1415 N. Sixth Street, Philadelphia 22, Pa.

***Liquidation: Most modern complete brewery*** ever! Stainless steel equipment throughout. Write for free illustrated circular: Mr. Bernard Z. Greenberg, Vice-Pres. c/o Brewers & Bottlers Equip. Corp., 104 Asylum St. Hartford, Conn.

***Buy To Advantage Acetic Anhydride, Glacial*** Acetic Acid, Acetaldhyde. "Produced locally for better service to you." Mercury Chemical Corp., Edison, N.J. Liberty 8-1540.

***Tank Trailers for Chemicals Stainless Steel—*** new and used. Hackett Trade Co., Inc. P. O. Box 803, Packers St., Kansas City, Kan. MA 1-2363.

***Lastiglas Lined Tanks: For immediate delivery*** —32 Lastiglas lined tanks—from 6,850 Gal. to 31,000 Gal. Priced to sell. Write for free listing: Mr. Frank J. Boitz, Field Manager c/o Brewers & Bottlers Equip. Corp., 104 Asylum Street, Hartford, Conn.

***DBS Plast. Virgin Bulk 35¢. Barium Hydrox.*** N.F. (J. T. Baker Orig.) 15 Leverpaks $0.06/lb. Toluol 10,000 gals. $.20/gal. Isoprene-Enjay virgin 3 drums $.15. Ohio Apex KP23 Plasticizer. Orig. drums $.12/lb. Virgin Neopentyl Glycol-20-100# drums. Trimethylol Propane 20-100# drums. Barrett Pyridine 15A 3 orig. drums $.35/lb. Acetone 10,000 gals. $.45/gal. DDA Plast., Virgin, 20 drs 37¢/lb. FS-3842, Chem. Wk.

***1960 sq. ft. T316 Stainless Heat Exchanger,*** ASME, 1953. Perry Equipment Corporation, 1415 North Sixth Street, Philadelphia 22, Pa.

***17,650 gal. T316 Stainless Horiz. Tank, 9' x 36',*** ¼" shell, ⅜" dished heads, 26 sq. ft. int. coil. Perry, 1415 N. 6th St., Phila., Pa.

## FOR RENT

***For Rent—4000 sq. ft. Former chemical labora-*** tory two story fireproof bldg. Tile walls, all utilities. Good for food processing laboratory etc. Call: Mr. Spewack: Main 4-7231.

## CHEMICALS WANTED

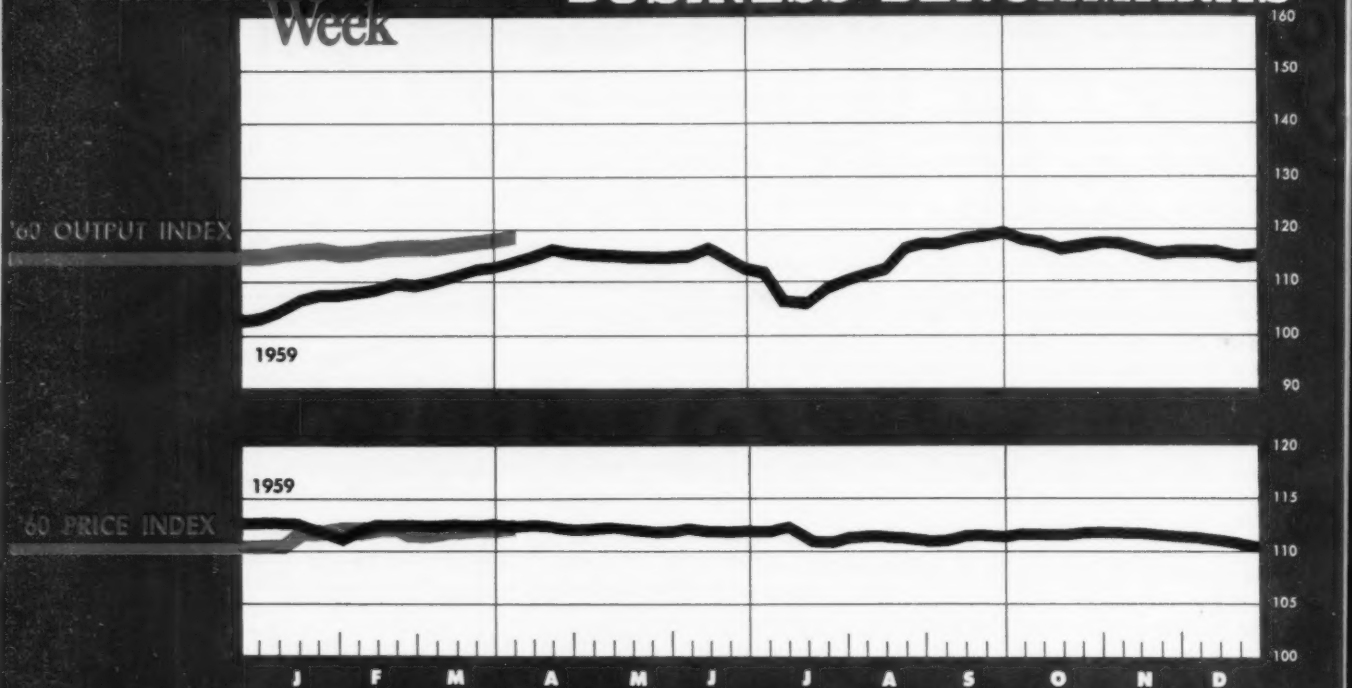
***Surplus Wanted — Chemicals, Pharmaceuticals*** Oils, Acids Plasticizers, Resins, Dyes, Solvents, Pigments, Etc. Chemical Service Corporation, 96-02 Beaver Street, New York 5, N. Y. HAnover 2 6970.

## WANTED

***Spectrophotometer, used, complete spectrum,*** recording type. A. Gersen, P. O. Box 658, Passaic, N. J.

Chemical Week

# BUSINESS BENCHMARKS

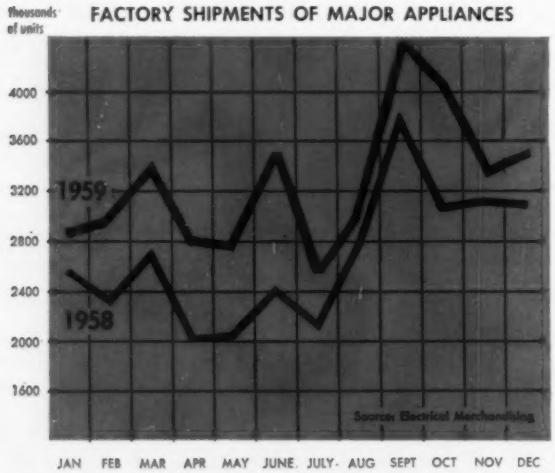



APRIL 2, 1960

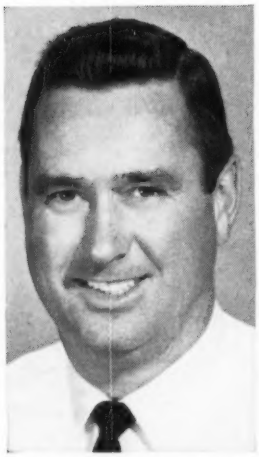
| WEEKLY BUSINESS INDICATORS | *Latest Week* | *Preceding Week* | *Year Ago* |
|---|---|---|---|
| Chemical Week output index (1957=100) | 118.1 | 118.0 | 114.0 |
| Chemical Week wholesale price index (1947=100) | 111.4 | 110.8 | 112.1 |
| Stock price index (12 firms, Standard & Poor's) | 53.37 | 53.31 | 53.02 |
| Steel ingot output (thousand tons) | 2,554 | 2,607 | 2,631 |
| Electric power (million kilowatt-hours) | 14,109 | 14,271 | 12,900 |
| Crude oil and condensate (daily av., thousand bbls.) | 7,116 | 7,049 | 7,203 |

| | **Manufacturers' Sales** | | | **Manufacturers' Inventories** | | |
|---|---|---|---|---|---|---|
| **TRADE INDICATORS (Million dollars)** | *Latest Month* | *Preceding Month* | *Year Ago* | *Latest Month* | *Preceding Month* | *Year Ago* |
| All manufacturing | 30,787 | 30,751 | 28,143 | 53,182 | 52,426 | 49,489 |
| Chemicals and allied products | 2,268 | 2,378 | 1,932 | 4,050 | 4,032 | 3,727 |
| Petroleum and coal products | 3,044 | 3,105 | 3,043 | 3,405 | 3,322 | 3,281 |
| Paper and allied products | 994 | 1,060 | 942 | 1,541 | 1,506 | 1,458 |
| Textile products | 1,226 | 1,261 | 1,102 | 2,554 | 2,530 | 2,449 |

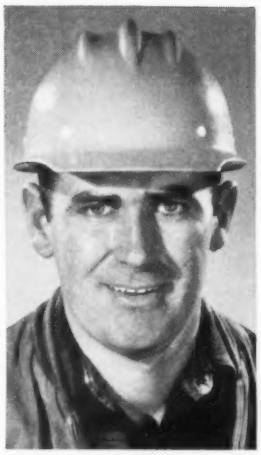
## CHEMICAL CUSTOMERS CLOSE-UP



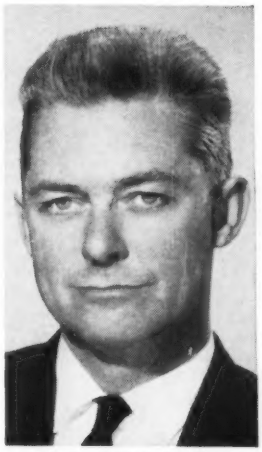
He's a nucleonics engineer



He works in a textile mill



He manages a giant "Cat Cracker"



He's a radio engineer

# B&A® ALUMINUM NITRATE

## can do a vital job for them

### ...and perhaps for you!

General Chemical's B&A Aluminum Nitrate is a high quality product assaying 99.75% $Al(NO_3)_3 \cdot 9H_2O$.

**PHYSICAL AND CHEMICAL PROPERTIES**

| | |
|---|---|
| Appearance | colorless to white, slightly moist crystals |
| Formula | $Al(NO_3)_3 \cdot 9H_2O$ |
| Molecular Weight | 375.14 |
| Density (approx.) | 13.2 grams per cubic inch |

**Melts in its water of crystallization at 73°C., and decomposes at 135°C. The aqueous solution is weakly acidic because of hydrolysis. Soluble in water, alcohol, acetone, nitric acid and carbon disulfide.**

**Typical Analysis:**

| | |
|---|---|
| Assay ($Al(NO_3)_3 \cdot 9H_2O$) | 99.75% |
| Insoluble in water | 0.005% |
| Iron (Fe) | 0.006% |
| Heavy Metals (as Pb) | 0.001% |
| Free Nitric ($HNO_3$) | 0.20% |

**Screen Size:**

| | |
|---|---|
| On 12 mesh | 8% |
| On 20 mesh | 48% |
| Thru 20 mesh | 44% |

**Here are suggested uses for B&A Aluminum Nitrate. You may have additional ones in mind:**

**Nucleonics**
**Petroleum . . . for the manufacture of catalysts**
**Textiles . . . in the dyeing of acetate rayon**
**Radio and Lamp industries . . . for the production of pure aluminum oxide**

A reagent grade of this product is also available for use in electronic tube production, in the manufacture of fluorescent lamps, and for other uses requiring an aluminum nitrate of particularly high purity. This reagent is packaged in the same sizes as the technical materials, which are shipped in 100-pound and 375-pound drums with polyethylene bag liners.

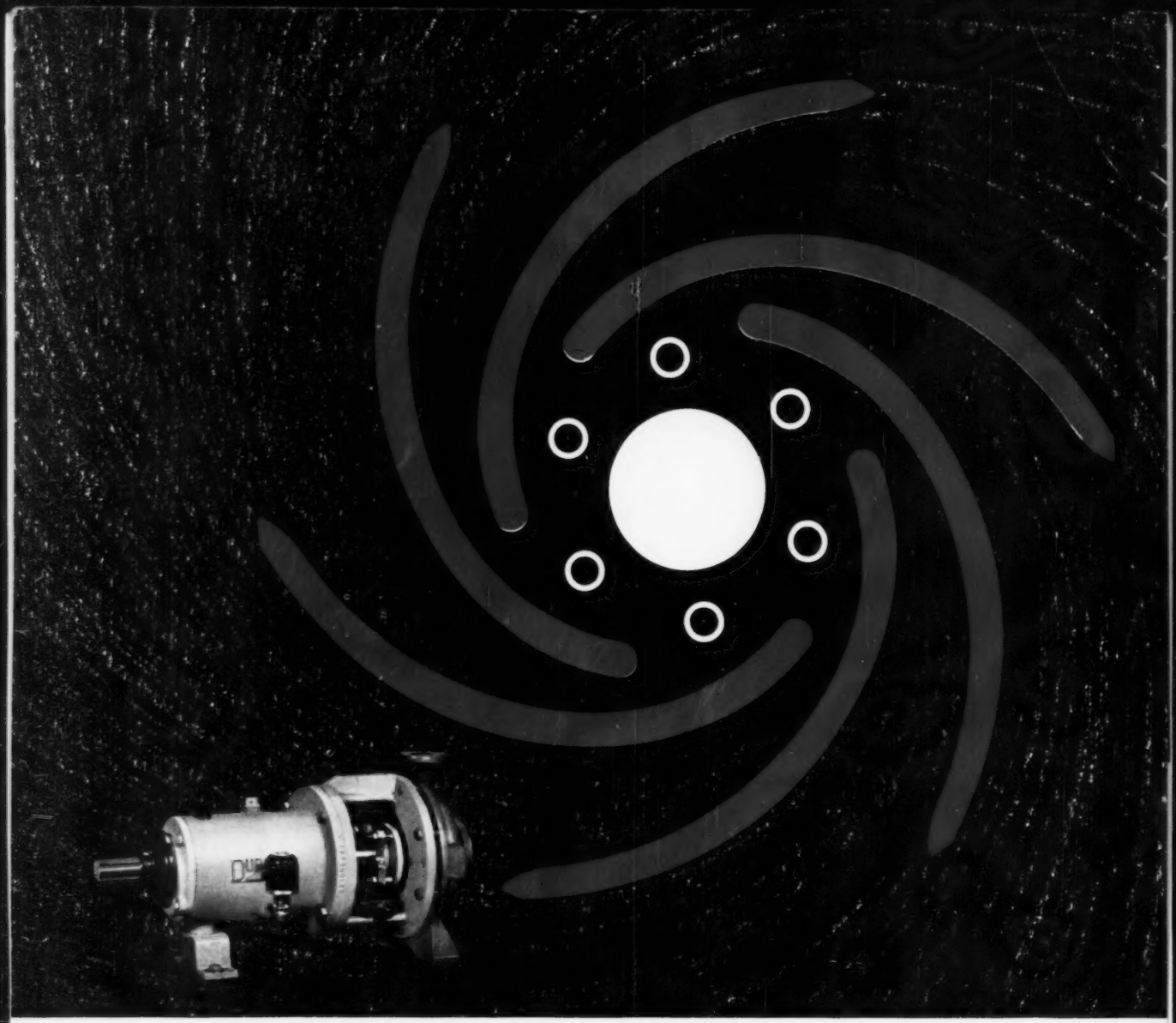
**Experimental Quantities Available on Request.** One pound and other smaller-than-standard packages are available on request on your business letterhead.

For Aluminum Nitrate, or for information about the many other B&A fine chemicals, call or write your nearest General Chemical sales office.

**BAKER & ADAMSON®**
**Fine Chemicals**

Allied Chemical

**GENERAL CHEMICAL DIVISION**
**40 Rector Street, New York 6, N. Y.**



# Specific design for pumping corrosives

Here is the first pump designed specifically for long life in heavy duty corrosive service.

Durcopumps are made in fourteen standard alloys and special materials. Four bearing housings plus separate frame adapters give maximum interchangeability for all pump sizes.

Maintenance is short and sweet because the working parts can be removed as a unit—in minutes—serviced and reinstalled by a single trade. Pump casing, piping and motor are not disturbed.

Durcopumps are produced in standard, self-priming and vertical submerged designs. Pumps are available with heads to 345 ft., capacities to 3500 gpm, in sizes from 1″ x 1″ to 10″ x 8″. Standard operating temperatures to 500° F.

Call your nearest Durco Service Engineer or write for literature on your service application.

DURCO

CORROSION RESISTING ALLOYS & EQUIPMENT

**THE DURIRON COMPANY, INC.,** Dayton, Ohio / Pumps • Valves • Filters • Process Equipment